NETWORK WORLD
The Newsweekly of User Networking Strategies

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Std. push for TCP/IP miffs OSI backers

By Paul Desmond
Senior Editor

WESTBOROUGH, Mass. — The proposed standardization of four TCP/IP protocols has garnered widespread support among users in the Internet community but is drawing the ire of Open Systems Interconnection advocates who say the effort will slow the growth of OSI.

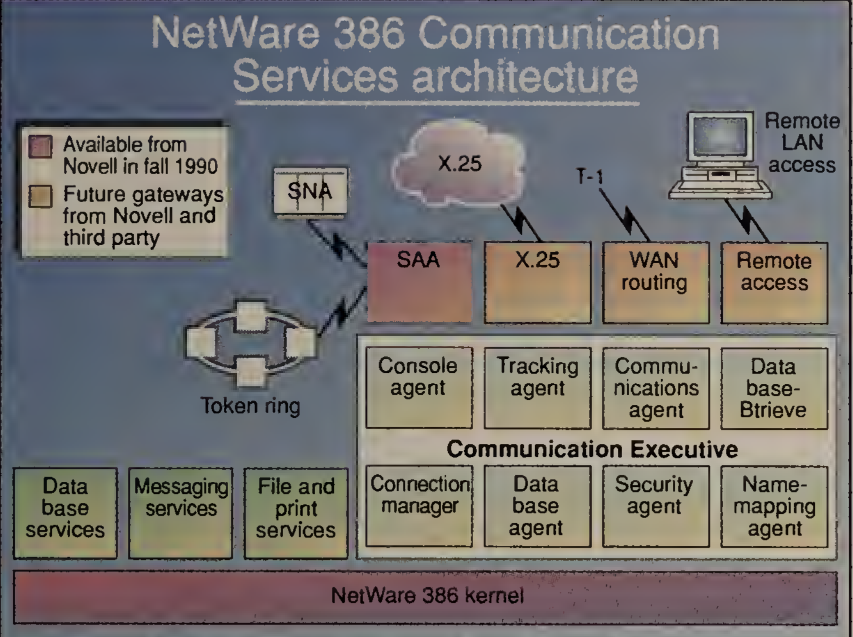
Users say standardization of Transmission Control Protocol/Internet Protocol — to be voted on by an ANSI task group here next week — will spur wider acceptance of TCP/IP, ease migration to OSI and reduce duplication of effort in the standards process.

But staunch OSI advocates largely disagree. They say standardization could further legitimize TCP/IP as a means for multivendor networking and encourage users and vendors to devote resources to TCP/IP implementation, delaying adoption of OSI.

"What we need more than anything else is a common way of addressing computing devices and providing end-to-end connectivity. And we don't need two competing standards for that because it will just slow down progress," said Laurie Bride, manager of network architecture at Boeing

(continued on page 60)

NetWare 386 Communication Services architecture



The first available NetWare Loadable Module for the Communication Executive is NetWare 386 Services for SAA (Systems Application Architecture), which supports LAN-to-IBM host links.

GRAPHIC BY SUSAN J. CHAMPENY

Retailers stock stores with LANs to improve service

In-store local networks make merchants more nimble in responding to local customer needs.

By Bob Brown
Senior Editor

As part of a shift to decentralized processing, a growing number of retailers are deploying in-store local-area networks to gain better control over inventory and respond to customer needs more quickly.

Currently, many retail outlets simply collect data about sales and inventory and upload it to host applications at corporate headquarters, where central buying decisions are made for an entire chain of stores.

But many retailers, such as K mart Corp. and Wal-Mart Stores, Inc., are installing LAN-based systems that give store managers a wealth of information and help identify buying trends and tailor inventories to reflect local customer preferences.

Retailers said they will continue to automatically replenish basic items for their chains, but dis-

(continued on page 62)

Novell, partners air bevy of WAN tools

Vendors promise to deliver products supporting Novell's NetWare 386 Communication Services.

By Susan Breidenbach
West Coast Bureau Chief

SUNNYVALE, Calif. — Novell, Inc. last week unveiled its NetWare 386 Communication Services here in the company of nine third-party vendors that announced support for this latest piece of the NetWare 386 network operating system.

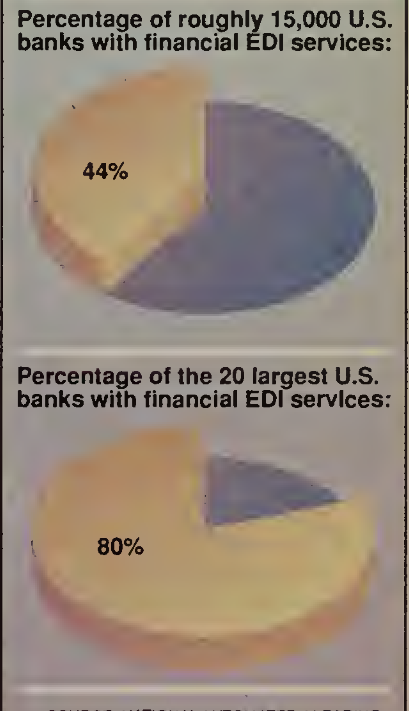
Digital Communications Associates, Inc. (DCA), Netlink, Inc., Phaser Systems, Inc., Proteon, Inc., SynOptics Communications, Inc., Wall Data, Inc. and Novell's own Indisy Software, Inc. subsidiary collectively promised 3270 terminal emulators, gateways, routers, groupware and network management software that would make use of the new Communication Services platform.

This platform actually consists of a group of NetWare Loadable Modules (NLM) that work in various combinations to provide NetWare users with access to non-NetWare resources in a wide-area network ("Novell set to intro Comm Server," *NW,* June 11).

The modules can run either as part of the main NetWare 386 server or on a separate processor acting as a communications server. Superserver manufacturers Compaq Computer Corp. and NetFRAME Systems, Inc. are writing drivers that will enable the new software to run on their spe-

(continued on page 62)

The status of financial EDI



SOURCE: NATIONAL AUTOMATED CLEARING HOUSE ASSOCIATION, MCLEAN, VA.
GRAPHIC BY SUSAN J. CHAMPENY

Financial EDI pits banks against VANs

By Barton Crockett
Senior Editor

Banks and value-added network (VAN) providers are gearing up for battle in one of the most promising new financial services markets of the 1990s — financial electronic data interchange.

Financial EDI involves the transmission of information regarding electronic funds transfers. While only in its infancy today, financial EDI may support nearly two billion corporate payments by the mid-1990s, consultants and bankers predict.

With the potential to charge 50 cents to $1 per transaction and the chance to land ancillary software sales and consulting

(continued on page 63)

NETLINE

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AT&T UNVEILS new FDDI wares, including bridges and routers for linking LANs over FDDI backbones. Page 2.

INSURERS FIND personal computer LANs a cost-effective alternative to mainframe systems. Page 2.

BROKERAGE FIRMS WILL team up in custom network pact to gain volume discounts on interexchange services. Page 2.

RBHCS UP IN THE AIR over enhanced services after appeals court overturns Computer III. Page 4.

OSI/NM FORUM RELEASES first set of specs for interoperable net management. Page 6.

FIBER MEDIA faces uphill fight despite benefits. Page 44.

NEWSPAPER

FEATURE

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Bridging token-ring, E-net LANs no easy task

By Colin Mick
Special to Network World

LAN TEST SERIES

Network managers needing to bridge Ethernet and token-ring nets start with two strikes against them.

First, few products are available to do the job — we counted four.

And according to the latest *Network World*/LanQuest Labs tests, only two of these can easily link token-ring nets with Ethernet LANs running under the popular Novell, Inc. NetWare operating system.

Second, Ethernet and token-ring networks vary widely in the sizes of packets used and in network management overhead. This makes comparison of data throughput extremely difficult.

This article examines the capabilities of the four Ethernet-to-token-ring bridges on the market, using a new benchmark test to determine actual throughput.

(continued on page 49)

AT&T unleashes volley of FDDI, 10BaseT products

Vendor intros FDDI brouters, bridge and net hub, adds net access unit, adapter for twisted-pair nets.

By Laura DiDio
Senior Editor

PHILADELPHIA — AT&T last week announced its first line of FDDI products, including bridges and routers that will enable local-area network users to link to other LANs over a high-speed backbone.

At a meeting here of its Network Users Group-AT&T, the company also announced two new IEEE 10BaseT-compliant products for running Ethernet over unshielded twisted-pair wiring. In addition, AT&T said its current Starlan 10 network hubs and adapters will comply with the 10BaseT draft standard.

Among AT&T's Fiber Distributed Data Interface products is the Starwan Brouter Model 450, an Ethernet-to-FDDI bridge/router that routes data traffic among Ethernets attached to an FDDI backbone.

In a typical configuration, the Starwan Brouter Model 450 simultaneously supports connection of 16 local Ethernets and four remote connections to a single FDDI backbone, according to Robert Donnelly, AT&T's computer networking marketing manager.

It can forward data from the LAN onto the backbone at 20,000 packet/sec, based on transmission of 64-byte packets, Donnelly said.

The Starwan Brouter Model 450 supports a variety of protocols, including the Transmission

(continued on page 63)

Insurers say LANs beat out hosts for some applications

LANs yield savings over hosts for different tasks.

By Tom Smith
New Products Editor

ANAHEIM, Calif. — While they're not yet ready to dump the corporate mainframe, insurance industry users say personal computer LANs are a cost-effective alternative to host-based systems for certain applications.

Local-area network users at the Insurance Accounting and Systems Association, Inc. (IASA) conference here recently said LANs provide a more economical method to support certain applications, such as word processing, spreadsheets and electronic mail.

The Travelers Corp. presented a cost/benefit analysis for a 4M bit/sec token-ring LAN in its securities department. The LAN, which supports about 160 users and cost more than $2 million to install, has enabled the insurance giant to save $644,000 annually, according to Joseph Veneziano, manager of investment strategy and systems in Travelers' securities department.

The greatest savings, estimated at about $500,000 per year, is realized by improving the productivity of securities department employees, who previously used a mix of host-attached dumb

(continued on page 6)

Brokerages to unite for volume network discounts

By Barton Crockett
Senior Editor

NEW YORK — The Securities Industry Association (SIA) last week said it plans to finalize by fall a custom network contract that could be used by hundreds of brokerage firms to obtain volume discounts on interexchange services.

The contract would enable participating firms to pool their network traffic through a single long-term deal with a long-distance carrier. Participants in the SIA custom network would receive volume discounts for switched, private-line and virtual network services, according to Rich Malone, chairman of the SIA's telecommunications and information management committee, which is negotiating the arrangement.

Malone discussed the contract in a private interview with *Network World* following the SIA's annual conference and exhibition here last week.

To date, the SIA has received bids from MCI Communications Corp. and US Sprint Communications Co., he said. AT&T is also expected to bid on the contract. Malone predicted that a deal would be finalized no earlier than this autumn.

(continued on page 60)

Briefs

FCC defends Tariff 12 decision. The Federal Communications Commission went to court last week to defend a decision it made last year that allows AT&T to offer custom network packages for voice and data services. The agency urged the U.S. Court of Appeals for the District of Columbia to deny an appeal of the Tariff 12 decision filed by MCI Communications Corp., US Sprint Communications Co. and the Independent Data Manufacturers Association.

One of the primary accusations concerning the FCC decision is that it allows AT&T to use Tariff 12 to discriminate among customers. The FCC argued that the assertion is invalid because it is being raised by competitors, not customers. The FCC also said its original decision on Tariff 12 was to reject it as unlawful and allow AT&T to fix the deficiencies and refile, which the carrier did. The agency said that, since it found the deals unlawful, there is no grounds for a court appeal.

AT&T inks two Tariff 12 deals. AT&T last week said it has landed two more Tariff 12 deals — one with Boise Cascade Corp. and the other with Anheuser-Busch Companies, Inc. — that together are worth $42 million. Boise Cascade signed a five-year, $28 million contract for a nationwide voice/data net that will link its Boise, Idaho, U.S. headquarters with offices in 35 states and the District of Columbia. Anheuser-Busch awarded AT&T a $14 million, four-year contract for a nationwide custom voice/data network linking the company's St. Louis headquarters with more than 500 sites including sales and distribution offices. The network will handle inbound and outbound switched services and incorporate an existing private-line data network that links major sites to the firm's headquarters.

Vitalink CEO resigns unexpectedly. George Archuleta, president, chairman and chief executive officer of Vitalink Communications Corp., unexpectedly resigned last week, sending the company's stock price tumbling from $12.87 to $9.62. The bridge vendor said Archuleta will be temporarily succeeded by Donald Herman, former chief executive officer of NCR Comten. Herman, who was recently named to Vitalink's board, will stay on until the company finds a new chief executive. Vitalink offered no explanation for Archuleta's departure.

DEC invests in StrataCom. Digital Equipment Corp. will announce this week it is making an eight-digit investment in StrataCom, Inc. Codex Corp. already owns 20% of StrataCom and resells the company's IPX FastPacket T-1 multiplexers.

Since StrataCom is a privately owned company, it is not clear how much Codex's 20% stake is worth or how DEC's investment will stack up against Codex's. StrataCom and Codex declined to comment on that, and DEC could not be reached for comment by press time.

CONTENTS

Industry Update
Local and long-haul carriers are evaluating the legal questions raised by a court decision last month that barred Bell Telephone of Pennsylvania from offering caller ID services. **Page 9**

Telecommunications
Four RBHCs are moving ahead with plans to offer on-line net management services based on BELLCORE software. **Page 13**

Data Communications
A group of 20 computer-aided design vendors next week will demonstrate a method to transfer design data among dissimilar CAD applications without using file conversion software. **Page 17**

Local Networking
Six of the largest LAN players seek to convince the Comdex/Spring audience that interoperability is their top priority. **Page 23**

Management Strategies
Network managers at Deloitte & Touche know that cooperation is the key to integrating disparate networks after a merger. **Page 27**

International Networks
The future of competition between Europe's carriers for U.S. network business may be foreshadowed by the dwindling price war between British Telecom and Mercury Communications. **Page 31**

Products & Services
Harris Adacom expands its SuperNet line with an IBM-compatible terminal controller and an SNA gateway. **Page 35**

Inside
Opinions **42**
Letters **43**
Networking Marketplace **55**
Networking Careers **56**

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See The FAXNet Form on Page #41

RBHCs unclear on Computer III ruling impact

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — In the wake of an appeals court ruling overturning the FCC's Third Computer Inquiry decision, the regional Bell holding companies are trying to determine just how they are supposed to run their enhanced services operations.

Two weeks ago, a federal district court in San Francisco ruled that the Federal Communications Commission acted capriciously in dropping its requirement that the RBHCs offer enhanced services through separate subsidiaries.

Now the carriers — many of which already offer enhanced services through their regulated telephone units — are sifting through the 75-page court order, attempting to determine whether they will have to immediately restructure their enhanced services operations. It is also unclear whether future services to be offered under Open Network Architecture (ONA), a key component of the Computer III decision, will be stalled.

If the appeals court decision stands, the RBHCs say it could slow down their efforts and increase the cost of rolling out enhanced services.

While the RBHCs were looking to the FCC for guidance, the agency said it had not reached a decision on how to proceed legally and asked the appeals court for more time to consider its options.

A spokesman for BellSouth Corp. described Computer III as "a very cloudy issue," adding that "the FCC hasn't provided much guidance yet. [The ruling] opens up so many cans of worms that we really don't know what it means yet."

However, Stephen Harris, director of regulatory planning and policy at Pacific Bell, downplayed the potential impact of the ruling. "We feel confident the FCC can substantiate that [it reached] the correct policy decision. I don't really expect that we're going to go back to [offering enhanced services] in a structurally separate environment."

A source at one of the RBHCs who requested anonymity said even if the appeals court decision stands and the carriers do not enjoy all the benefits of ONA, his company is committed to opening its network to competing enhanced services providers. "We're not about to say, 'Well since we don't get structural relief, we're taking all of our marbles and going home,' " the source said.

US West said in a prepared statement, "The ruling is disappointing because it throws confusion into a process that was steadily evolving and would have brought a host of new services to consumers. The prospect of state regulators reviewing en-

(continued on page 60)

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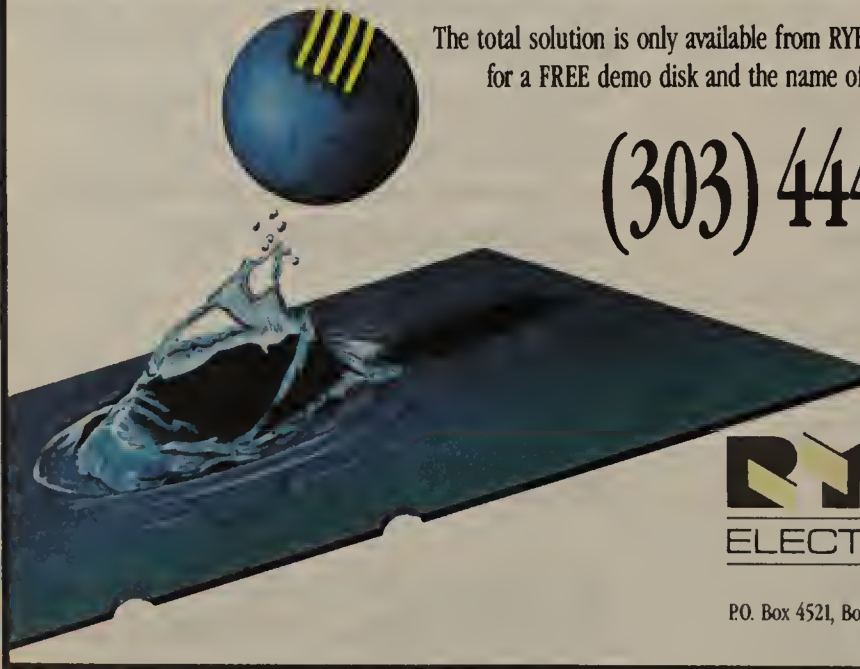

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Group warns of dire risk to N.Y. from major public network crash

Says network vulnerability threatens $1 trillion in daily financial transactions; urges state and city action to fortify facilities.

By Bob Wallace
Senior Editor

NEW YORK — Warning that more than $1 trillion in daily financial transactions could be disrupted by a major service outage in Manhattan, a coalition is pressing the city and state of New York to create and implement a plan to fortify the state's public network.

> The report recommended that the PSC streamline the current process for introducing telecommunications services.
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The New York City Partnership, Inc., comprising 150 business and civic leaders, laid out a plan of action for the city, the state and the Public Services Commission (PSC) in a report it prepared with Booz, Allen & Hamilton, Inc., a consultancy based here.

Members of the New York Partnership include American Express Co., Bankers Trust Co., Chemical Bank, Colgate-Palmolive Co., Metropolitan Life Insurance Co. and Time-Warner, Inc.

The report, titled "The $1 Trillion Gamble: Telecommunications and New York's Economic Future," stated that city and state governments should convene a high-level task force to create a detailed implementation plan within six months that would make the state's telecommunications network more resilient.

According to the report, the plan should, at a minimum, call for carriers to support firms in key business districts from multiple telephone central offices in order to protect the companies against cable breaks and central office disasters. The report also said the state should provide significant tax incentives for carriers to install alternate and backup lines in planned office parks.

The report recommended that the Public Services Commission streamline the current process for introducing new telecommunications services and revise depreciation schedules to ensure they reflect the useful life of equipment. The PSC

(continued on page 63)

Ameritech, Bell Atlantic acquire New Zealand's telephone company

RBHCs buy Telecom of New Zealand in overseas expansion.

By Walter Sweet
West Coast Correspondent

WELLINGTON, New Zealand — Ameritech and Bell Atlantic Corp. last week announced that they will acquire the state-owned Telecom Corp. of New Zealand for about $2.4 billion.

The acquisition, which is expected to be completed in 90 days, is one of the most significant efforts by regional Bell holding companies to expand overseas investments. The move could ultimately make New Zealand an attractive hub site for network traffic from the U.S.

Under terms of the deal, Ameritech and Bell Atlantic will acquire Telecom of New Zealand and then sell 5% stakes to the New Zealand companies Fay, Richwhite Holdings, Ltd. and Freightways Holdings, Ltd.

The companies are also required over the next four years to sell off another 40.1% of the company through stock offerings around the world, leaving the two RBHCs with just under 50% ownership.

To get around Modified Final Judgment regulations that prohibit the RBHCs from carrying long-distance traffic, Fay, Richwhite and Freightways Holdings will establish a separate subsidiary that will terminate calls originating in the U.S. The two RBHCs are asking for an exemption from current Modified Final Judgment restrictions so that they can carry international traffic to New Zealand.

High dividends

Ameritech and Bell Atlantic executives characterize the deal as an investment that will earn high dividends.

"New Zealand Telecom is a strong company that has significant growth potential in its home market," said Steve Ford, a spokesman for Chicago-based Ameritech. "New Zealand is also the gateway to Southeast Asia and the Pacific Rim, and that's important to us as we look to be a more global telecommunications company."

> Some observers argued that foreign ventures by RBHCs represent a flight of capital that could hurt U.S. users.
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But some observers questioned the wisdom of the investment, arguing that large foreign ventures by RBHCs represent a flight of capital that could hurt U.S. users.

"These guys amaze me," said Ken Zita, a senior analyst with the META Group, a consultancy in Westport, Conn. Zita said he believes that the RBHCs should concentrate on improving the public network in this country rather than investing money abroad.

Zita said Ameritech and Bell Atlantic

(continued on page 59)

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OSI/NM Forum releases first specs for net mgmt.

Guidelines put application developers in sync.

By Bob Brown
Senior Editor

NEW YORK — The Open Systems Interconnection/Network Management (OSI/NM) Forum last week released its first set of specifications that vendors can use to build interoperable network management applications.

Hailed by users and vendors alike, the Release 1 specifications cover fault and configuration management, which are the functional areas of most concern to users, a forum spokesman said.

The fault management specifications define how network management systems exchange alarms and diagnostic information. Fault management tools are used to monitor nets, and to identify, log and resolve network problems.

> “This takes the ball from the forum’s court and puts it into the vendors’ court,” said HP’s Mahler.
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Configuration management specifications provide a common mechanism for identifying components — the managed objects — in a multivendor net. That information is used by network management tools for such tasks as fault analysis, performance monitoring and accounting. It is also used by products that control and reconfigure net resources.

The set of specifications was delivered on schedule.

In addition to the specifications, the forum has readied conformance test tools in conjunction with the Corporation for Open Systems International (COS) and the Standards Promotion and Application Group (SPAG). The tools are now in beta test and will be available to forum members in July. They will be generally available later this year.

Most vendors contacted by *Network World* said they expect to have products based on the forum’s Release 1 specifications available next year, though others may deliver them sooner. The vendors will incorporate the specifications into existing management products.

“Our goal has been to accelerate the use of OSI standards for interconnection of network management systems,” said Keith Willetts, the forum’s outgoing president. “These specifications will enable [vendors] to proceed with product development.”

The forum has about 100 members, including AT&T, Hewlett-Packard Co. and 3Com Corp.

“It’s big news any time you have a multivendor organization that completes work of this magnitude and quality,” said Dave Mahler, product marketing manager for OpenView at HP, one of the 2-year-old forum’s founding members. “This takes the ball from the forum’s court and puts it into the vendors’ court.”

HP plans to roll out network management products incorporating forum specifications next year as will “the overwhelming majority” of other members, said Mahler, HP’s representative to the forum’s board of directors.

Given that some forum members were intimately involved in the specification development process, some products may be out this year. But it will be next year before most products go through conformance testing and are generally available, said Bill Gilbert, AT&T’s director of network management. AT&T expects to implement the specifications in such products as Accumaster Integrator and AT&T Paradyne’s modem management systems, he said.

The forum’s Conformance Test Tools will ensure that OSI-based management applications conform to OSI/NM Forum guidelines. COS provided lower layer test systems and SPAG offered application profile test systems.

The test tools will be available to vendors that want to test their products and pass along results to the forum and COS or SPAG. COS and SPAG will also perform testing in their labs for vendors, a forum spokesman said.

Forum members plan to demonstrate later this year the interoperability of their products based on the specifications at the forum’s Network Management Showcase (see “Demos top show agendas,” this page).

Users welcomed the forum’s announcement.

(continued on page 62)

NW bulletin board offers helpful forum for readers

FRAMINGHAM, Mass. — *Network World’s* recently installed electronic bulletin board is proving to be a useful way for network users across the country to share ideas, opinions and information about technical and industry matters.

In addition to providing an efficient way for readers to submit letters to the editor, pass on story tips and offer suggestions on how to improve the newspaper, the bulletin board supports an Open Forum feature, where subscribers can solicit input from colleagues.

In its first few weeks of operation, the forum has been used for discussions about everything from experiences with specific vendors to technical problems with sending facsimilie traffic over T-1 links used to access virtual network services.

One subscriber writes:

“I’m trying to develop a local high-speed network using TCP/IP over Ethernet that involves a host sending messages to 15 to 20 terminals. I want to send the same message to each terminal but would like to multicast it so that the host doesn’t have to send the same message 15 times.

“I could do it with [the Universal Data Protocol] but the transmission needs to be reliable, which means that the host must receive an acknowledgment from each terminal, and UDP doesn’t do that. There is a new TCP/IP protocol called Versatile Message Transaction Protocol (VMTP) that provides multicasting and acknowledgment. Does anyone know if VMTP has been implemented commercially or, if not, whether anyone has implemented it in a custom application?”

Others are looking for input on specific projects.

“We are considering implementing a metropolitan-area network to handle information transfer between workstations at various city facilities as part of.a proposed geographical information system,” read a message posted in the forum by a subscriber. “An optical fiber-based installation would appear to be ideal because of its capacity and noise immunity. I would be interested in any information or experience anyone may have in this area.”

If you have answers to these queries or questions of your own, please join your colleagues on the *Network World* bulletin board.

We have two numbers now and plan to add three more and a modem hunting feature. The current access numbers are (508) 620-1160 (supporting 300 to 2,400 bit/sec) and (508) 620-1178 (a V.32 modem supporting 300 to 9.6K bit/sec).

Demos top show agendas

NEW YORK — The Open Systems Interconnection/Network Management (OSI/NM) Forum last week announced that its members will demonstrate net management products based on forum specifications at a series of trade shows this year and next.

The forum’s Network Management Showcase program will feature interoperability demonstrations and give vendors recognition for passing conformance tests that ensure the specifications have been properly implemented in network management products.

“Early on in the Showcase schedule, vendors will have early implementations of products,” said Bill Gilbert, AT&T’s director of network management. “Later on, vendors will have real products and we’ll have the conformance-testing products.”

The first Network Management Showcase will take place Sept. 18 through 20 at the Canadian Business Telecommunications Alliance conference in Montreal.

The Showcase will also be held Sept. 25 through 27 at the Tele-Communications Association, Inc. show in San Diego; Oct. 10 through 12 at the INTEROP 90 Conference and Exhibition in San Jose, Calif.; and Jan. 28 through 30 at the Communication Network ’91 Conference & Exposition in Washington, D.C.

The Showcase will be held at other shows in North America and Europe next year.

— Bob Brown

Insurers say LANs beat out hosts

continued from page 2

terminals and stand-alone personal computers.

Veneziano said Travelers estimates that the cutover resulted in a 5% productivity gain, which represents $500,000 on the department’s annual budget of about $10 million. The company derived this figure as a conservative estimate based on 10% productivity gains frequently attributed to automation projects.

Citing a precise productivity improvement is difficult, however. Such a figure would have to factor in data such as the ability of portfolio managers to analyze large amounts of data and conduct better scenario planning, forecasting and portfolio monitoring than they could prior to the implementation of the LAN.

Other savings come from purchasing network versions of applications. For example, Travelers worked out a licensing agreement with its relational data base management supplier in which software is priced at $25 per LAN node, whereas a standalone version costs $320 per user. By using networked software, Travelers’ securities department saves about $100,000 annually, Veneziano said.

Network software packages also simplify software upgrades and changes because new software can be installed once on a server and downloaded to client workstations, rather than being installed on each personal computer. “Without the LAN, we estimate that an additional 1¼ people would be required to perform software changes to departmental computers,” Veneziano said. Annual savings in this category total about $64,000.

Through these and other areas, The Travelers’ securities department saves $864,000 per year before recurring costs.

Other users said savings could be gained by using personal computer LANs to develop mainframe programs. Using terminals to develop mainframe applications on the host costs $1,100 to $1,200 per month in mainframe usage for each terminal, according to Moe Shahpar, senior manager in system integration at Arthur Andersen & Co.’s Andersen Consulting practice in Chicago.

Using personal computers as application development tools, by contrast, costs just $700 per month per workstation. Shahpar said these figures were derived from research done by Gartner Group, Inc. in Stamford, Conn.

Andersen Consulting has begun training its programmers on personal computers rather than terminals, at a $6 million-per-year savings, Shahpar said.

Jim Gay, director of corporate telecommunications at Nationwide Insurance Co. in Columbus, Ohio, said the mainframe will endure as the corporate data repository, handling applications such as reporting systems, accounting and payroll. Nationwide Insurance uses token-ring LANs to handle applications such as E-mail, and end-user utility and productivity programs, Gay said.

Another user, General Reinsurance Corp., also in Stamford, agreed that because E-mail requires a lot of mainframe CPU cycles, it is well suited for LANs.

“Our mainframe E-mail is not the kindest animal on our CPU,” said Charles Agin, vice-president at General Reinsurance, which is trialing two 4M/16M bit/sec token-ring LANs. “Because 70% to 90% of E-mail is within a work group, it’s more sensible to have it nearby with users linked locally.”

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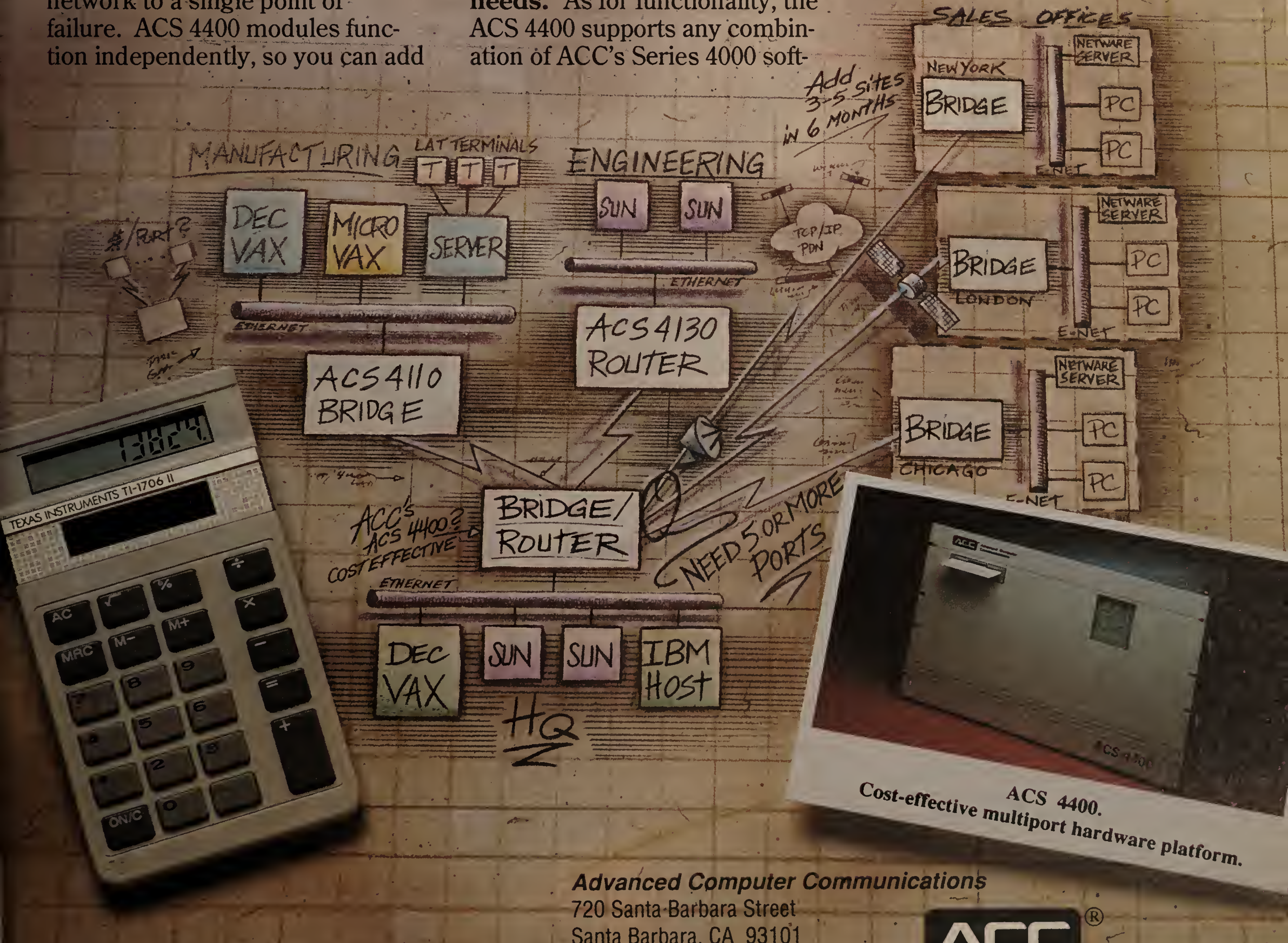

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

> "Carriers are largely to blame for letting the service aggregation market get out of hand in the first place. There are no quality control measures in place to make sure that aggregators are doing business in the best interest of users."
>
> **Nat Freedman**
> President
> Nathan Freedman Associates, Inc.
> Marlboro, N.J., consulting firm

People & Positions

Codex Corp., a Mansfield, Mass.-based maker of data communications equipment, named **Scott Augerson** to the newly created position of senior director of market development.

Augerson will be responsible for directing, developing and implementing tactical marketing and sales programs that support network products and services for Codex's U.S. distribution and sales organizations.

Before accepting this position, Augerson was director of private branch exchange marketing and requirements at Rolm Co.

Donald Salerno, a 33-year AT&T veteran, last week was named vice-president of carrier relations at **Locate**, a New York-based alternative access carrier.

In his position, Salerno will have responsibility for strategic planning, strengthening Locate's relationships with interexchange carriers and, in particular, broadening the company's knowledge of AT&T's services, structure and technical interface capabilities.

Before he joined Locate, Salerno held the position of district manager for international service development at AT&T.

Sony to enter U.S. market for videoconferencing gear

Agrees to resell CLI codecs in turnkey package.

By Ellen Messmer
Washington Correspondent

PARK RIDGE, N.J. — Sony Corp. recently announced it has signed a reseller agreement with Compression Labs, Inc. (CLI) for video coder/decoders that will pave the way for the Japanese firm to enter the U.S. videoconferencing market.

Industry analysts said they expect Sony's presence in the domestic market to legitimize the technology for potential buyers, as well as give rise to innovation and price competition among current suppliers.

Analysts said the deal could be the first of several in which U.S. codec makers pair up with large Japanese companies entering the market.

Until now, Sony has sold videoconferencing components such as cameras, monitors and systems in the U.S., but it lacked a quality codec that it could package into a complete system.

T.C. Browne, vice-president and general manager in Sony's Video Conferencing and Satellite Systems Division, said Sony entered into the deal with CLI because "the time is right for a try at the U.S. market." The advent of the H.261 videoconferencing standard, which should be completed this November, is expected to spark a sales explosion.

"The industry is maturing," Browne said. "It's gone beyond a cottage industry. What we're bringing to this industry is legitimacy. People will say it's time to use [videoconferencing] now."

Under the agreement with CLI, Sony will resell all of the company's codecs, including the Rembrandt II/06, which will be upgraded to support the H.261 standard. Initially, Sony plans to market its videoconferencing systems primarily through systems integrators, Browne said. Over time, it expects to develop its own direct sales organization.

Scott Douglas, managing director at the Lake Wylie, S.C.-based consultancy Telemanagement Resources International, Inc., said he expects innovation from Sony. "They're going to be adept at packaging and have deep pockets for R&D," he said.

For the past five years, Sony has distributed CLI's codecs in videoconferencing systems it sold in the Far East. Since 1988, Sony has worked with CLI to man-

(continued on page 11)

INDUSTRY BRIEFS

Twenty hardware, software and end-user companies last week announced their intention to incorporate the Open Software Foundation's Distributed Computing Environment into their software products and systems development.

Nick Donofrio, president of **IBM's** Advanced Workstations Division, said IBM would support the Distributed Computing Environment technology on its AIX workstation and server products. Kurt Friedrich, group engineering manager for **Digital Equipment Corp.'s** Open Software Group, said DEC would support the technology on its Ultrix product lines.

Other organizations that announced support for the computing environment include Carnegie-Mellon University, Group Bull SA, Hewlett-Packard Co., Informix Software, Inc., Ingres Corp., Interactive Systems Corp., Intergraph Corp., Mentor Graphics Corp., Microsoft Corp., Nixdorf Computer Corp., The Putnam Companies, Siemens AG, Silicon Graphics, Inc., Stanford University, Stratus Computer, Inc., Sybase, Inc., Transarc, Inc. and Tricor Systems, Inc.

ALC Communications, the parent company of long-distance provider **Allnet Communication Services, Inc.**, last week announced it has restructured certain of its financial obligations. The restructuring includes the extension of the payback period for several loans and the renewal of a credit line with a lending company. Marvin Moses, chief financial officer for ALC, said the restructuring would result in a $1.2 million per month reduction in operating costs and would give the company a stronger financial footing.

In January, ALC signed a letter of intent to merge with Tele-

(continued on page 10)

RBHC caller ID and call-blocking plans

RBHC	Caller ID services status	Call-blocking policy
Ameritech	Plans to offer caller ID in Ohio, later in other states.	Would like to offer caller ID without blocking; hopes Ohio Public Utilities Commission acceptance will be model for other states.
Bell Atlantic Corp.	Offered in Maryland, New Jersey, Virginia and West Virginia; plans to offer in Washington, D.C. and Delaware. Suspended in Pennsylvania by court.	Corporate view is that blocking reduces value of caller ID services.
BellSouth Corp.	Offered in Tennessee; plans to offer caller ID in eight other BellSouth states.	Caller ID without blocking; will provide blocking if PUC requires it.
Nynex Corp.	Available in Vermont; plans to offer it elsewhere.	No stated policy yet, taking path of least PUC resistance.
Pacific Telesis Group	Plans to offer caller ID with per-call blocking in California.	California law requires per-call blocking; Pacific Bell supports policy.
Southwestern Bell Corp.	Plans to offer caller ID, though no firm timetable.	Currently developing corporate policy.
US West, Inc.	Not committed to offering caller ID.	No policy.

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: THE YANKEE GROUP, BOSTON

Carriers study effects of caller ID ruling

Banning of service in Pennsylvania leads BOCs to reevaluate their offerings, research state laws.

By Bob Brown
Senior Editor

HARRISBURG, Pa. — Local and long-haul carriers are evaluating the legal questions raised by a court decision last month that barred Bell Telephone Co. of Pennsylvania from offering caller identification services.

Although most carriers said they do not expect the Pennsylvania ruling to derail their plans for caller ID services because the decision was based on specific state laws, most of them said their lawyers are reviewing the case to determine if the carriers might encounter similar difficulties with other states' laws.

Three weeks ago, a state appeals court here ruled that Bell of Pennsylvania's caller ID service violated the state's wiretap law and privacy provisions in the state's constitution. The carrier, whose caller ID services were opposed by a coalition of consumer and civil rights groups, appealed the ruling to Pennsylvania's Supreme Court ("Court bars Pennsylvania Bell from offering caller ID," *NW,* June 4).

Although an isolated incident, industry watchers said there is a lesson in the ruling. The Pennsylvania court went well beyond what Bell of Pennsylvania's caller ID opponents were asking for — the option of call blocking — possibly because the carrier took such a hard-line stance against the option. Call blocking is the ability to prevent the transmission of the caller's telephone number to the called party.

"Bell Atlantic Corp. [Bell of Pennsylvania's parent company] was moving so aggressively into [Custom Local Area Signaling Services] and caller ID that it didn't pause to examine the degree of caller ID controversy," said Berge Ayvazian, a vice-president at The Yankee Group, a Boston-based market research firm. "That's come back to haunt Bell Atlantic."

> "Bell of Pennsylvania didn't play very sensibly," Gartner Group's Draper said.

▲▲▲

Liza Draper, director of research at Gartner Group, Inc.'s Washington, D.C. office agreed. "Bell of Pennsylvania didn't play very sensibly. I think the idea that caller ID will be banned across the nation has been overblown, however. It will be handled on a state-by-state basis."

More sensitive

It is likely that carriers will be more sensitive to future demands for call blocking, industry watch-

(continued on page 10)

Carriers study effects of caller ID ruling

continued from page 9

ers said. This may be particularly true in that the American Civil Liberties Union, which was part of the coalition that brought suit against Bell of Pennsylvania, has vowed to oppose caller ID across the country.

Spokesmen for US West, Inc. and Southwestern Bell Corp., neither of which is offering caller ID services commercially, said their companies are examining the Pennsylvania ruling because both carriers may offer caller ID services in the future.

GTE Corp., which last week announced plans to begin trialing caller ID services in Kentucky, said it plans to offer consumers two telephone numbers per line via an option called Protected Number Service. This option is designed to let callers disguise their phone numbers — at a price.

Some carriers, such as Pacific Bell, have little choice but to offer call blocking on a per-call basis because it is required according to California law.

"The state law supports our initial contention that per-call blocking is appropriate," a Pacific Bell spokesman said. "In customer studies, we found that per-call blocking is what they need to protect their privacy."

The Yankee Group's Ayvazian noted, "There is an opportunity to use the California model as a way to strike a compromise, rather than put all caller ID at risk by putting it in the hands of judges who could apply wiretap laws inappropriately and outlaw services outright."

Lessens the value

Several carriers said they will offer call blocking if need be, but, like Bell Atlantic, they would prefer not to. They agreed with Bell Atlantic's contention that call blocking lessens the value of caller ID both to consumers concerned about harassing phone calls and businesses that wish to collect customers' numbers for telemarketing purposes.

In its caller ID trials, BellSouth Corp. is working with public utility commissions (PUC) to "come to reasonable accommodations where there are concerns about caller ID," a company spokesman said. For instance, BellSouth has submitted to state PUCs' demands that certain law enforcement agencies and social service agencies be able to block calls as a safety precaution, he said.

Nynex Corp. would prefer not to offer call blocking, company executives said. "We think the commercial and public benefits of having caller ID without call blocking fit nicely," said Larry Cashion, director of regulatory issues at Nynex Service Co. in White Plains, N.Y.

The carrier is working with consumers and businesses in Vermont, where Nynex is offering caller ID, to teach users ways to avoid having their numbers identified via caller ID other than using a call blocking option, Cashion said. These options include using an operator or a calling card, he said.

Long-distance carriers, concerned that state bans on caller ID could be extended to include interexchange services such as 800 and Integrated Services Digital Network offerings, said they are studying the Pennsylvania case but have seen no signs that their offerings are in jeopardy.

> BellSouth is working with PUCs to "come to reasonable accommodations where there are concerns about caller ID."

▲▲▲

"We don't think it has any effect on our existing ISDN offering," said Harry Hollings, Signaling System 7 product manager for AT&T. AT&T will continue to provide automatic number identification for calls originating in Pennsylvania to its Primary Rate Interface customers, he said. ☑

Industry Briefs

continued from page 9

com*USA, Inc., in a move that analysts said would have greatly improved ALC's financial situation. But that agreement broke off weeks later.

AT&T and **3Com Corp.** last week announced they have joined the **Station Management (SMT) Development Forum,** a Billerica, Mass.-based consortium concerned with developing and promoting interoperable Fiber Distributed Data Interface local-area networks.

As members, AT&T and 3Com will gain access to the latest developments in FDDI LAN management technology. Other members include Apple Computer, Inc. and IBM.

Voice-Tel, Inc., the voice-messaging service franchise, announced a strategic partnership with **Amway Corp.** Under the five-year contract, Amway distributors will resell Voice-Tel services to Amway's customer base. Voice-Tel franchises offer a variety of voice-messaging services in their individual markets. ☑

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Microcom takes beating on Wall Street after revealing fiscal woes

By Bob Brown
Senior Editor

NORWOOD, Mass. — Microcom, Inc.'s stock took a dive last week as Wall Street reacted to the company's recent disclosure of expected lower revenue and a loss for its fiscal first quarter, which will end June 30.

Last Monday, Microcom's stock fell $8.50, from $18.25 to $9.75, following the company's June 8 announcement. By Wednesday, however, it had marginally recovered to $11.

Analysts said Microcom customers should not be concerned because products will still be readily available. In general, analysts expressed confidence in Microcom's strategy to diversify from strictly manufacturing modems into software and internetworking products.

The anticipated sales and earnings drops are due to an overstocking of software and modems by domestic distributors, Jim Dow, Microcom president and chief executive officer, told *Network World*. It is unlikely that Microcom's distributors will need additional product shipments during this quarter, he said.

Consequently, Microcom — a $75 million firm that has reported 17 profitable quarters in a row — expects earnings per share to drop from 29 cents in last year's first quarter to a loss per share between 15 and 20 cents for the quarter. The company expects first-quarter revenue to fall to $14 million, down from $17 million in the first quarter last year. Analysts said they had expected revenue to be about $20 million for the period.

The major reason for Microcom's expected first-quarter slide is that distributors had difficulty selling $4 million worth of Microcom's recently introduced Carbon Copy Plus + Host personal computer communications software package.

Dow said distributors ordered the software during the fourth quarter, which ended March 31, but only a few orders for the product were received in the first quarter.

"There was no demand for the product," said Paul Johnson, a vice-president at Needham & Co., a New York-based full-service brokerage firm.

Microcom's line of Carbon Copy Plus products are used to control and access remote personal computers. But distributors had difficulty selling the newer Carbon Copy Plus + Host, which is aimed at users with more limited needs than those who use the regular Carbon Copy Plus, Johnson said. Some of the distributors were not used to selling into the lower end of the market, he added.

In fact, some distributors want to swap the newer Carbon Copy Plus + Host software for the original, better selling Carbon Copy Plus software, said Michel Guite, a vice-president at Salomon Brothers, Inc., a New York-based investment firm. Distributors have also asked Microcom for more help in trying to sell the software, he said.

Microcom will launch a new advertising campaign in an effort to boost sales of Carbon Copy Plus + Host, Dow said.

Another factor contributing to Microcom's poor performance this quarter is that sales of Microcom's traditional modem products fell below expectations, Dow explained. Some observers said the modem market may be decelerating at a rate faster than Microcom expected, though Dow denied this was true.

Despite the disappointing events, Dow said Microcom has no plans to make an inventory write-off or resort to work force reductions. ◻

Sony to enter U.S. mart for video gear

continued from page 9

ufacture the video output and input technology in CLI's Rembrandt II/06 codecs.

John Walsh, executive vice-president of marketing and sales at CLI, said the new agreement will result in higher codec sales for the company. But despite Walsh's optimism, Sony is not committed to using CLI's products exclusively under the new agreement. Browne said it is possible that Sony will produce its own codec in the future.

Sony's T.C. Browne

PictureTel Corp., a key rival to CLI in codec manufacturing, had also discussed forming a strategic partnership with Sony. But PictureTel did not pursue an agreement because the firm saw no advantage in it.

After being approached by Sony last year, PictureTel decided not to form such an alliance, according to Robert Mitro, vice-president of sales and marketing for the firm. "Why would I want another competitor in the marketplace?" he asked. ◻

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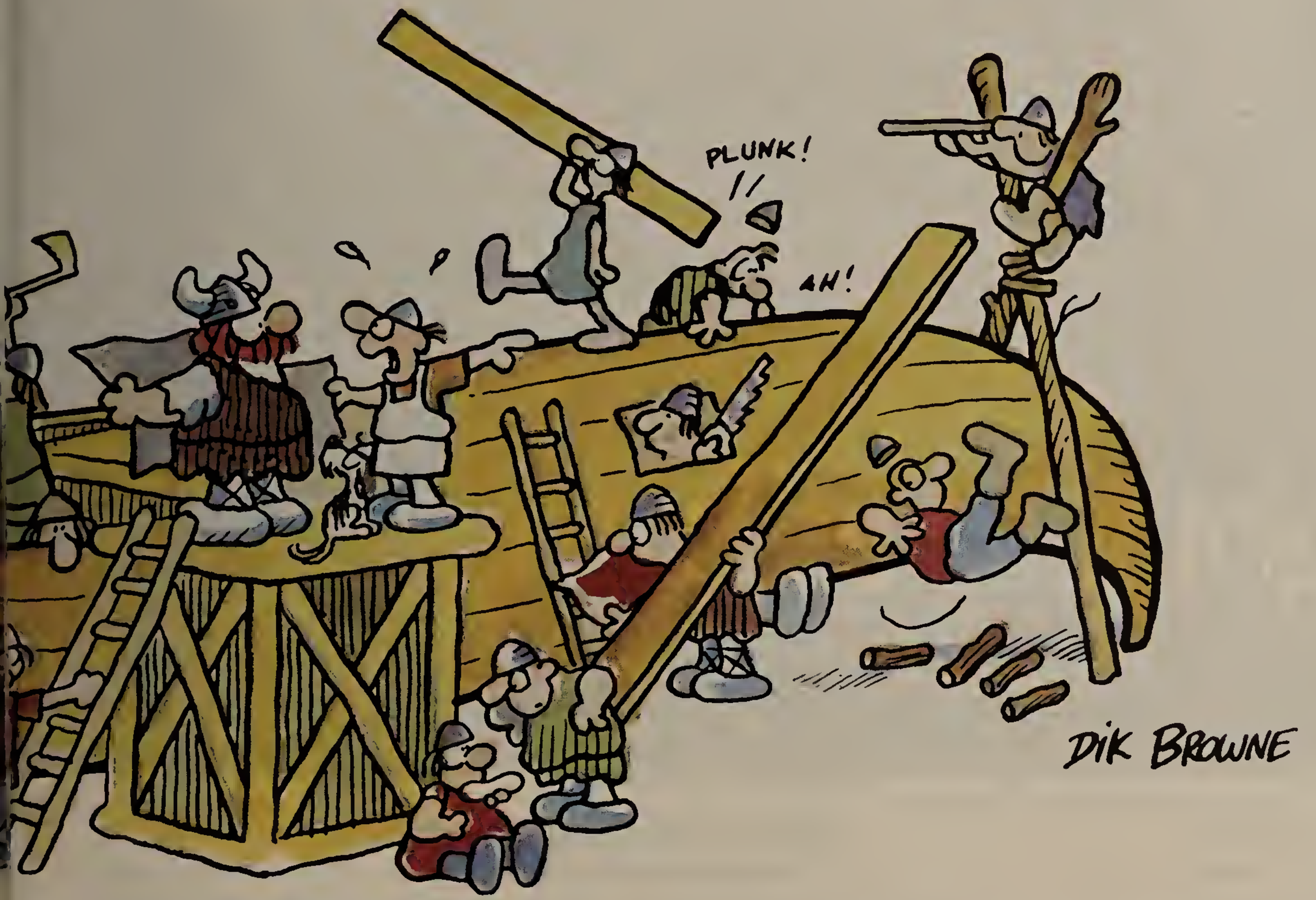

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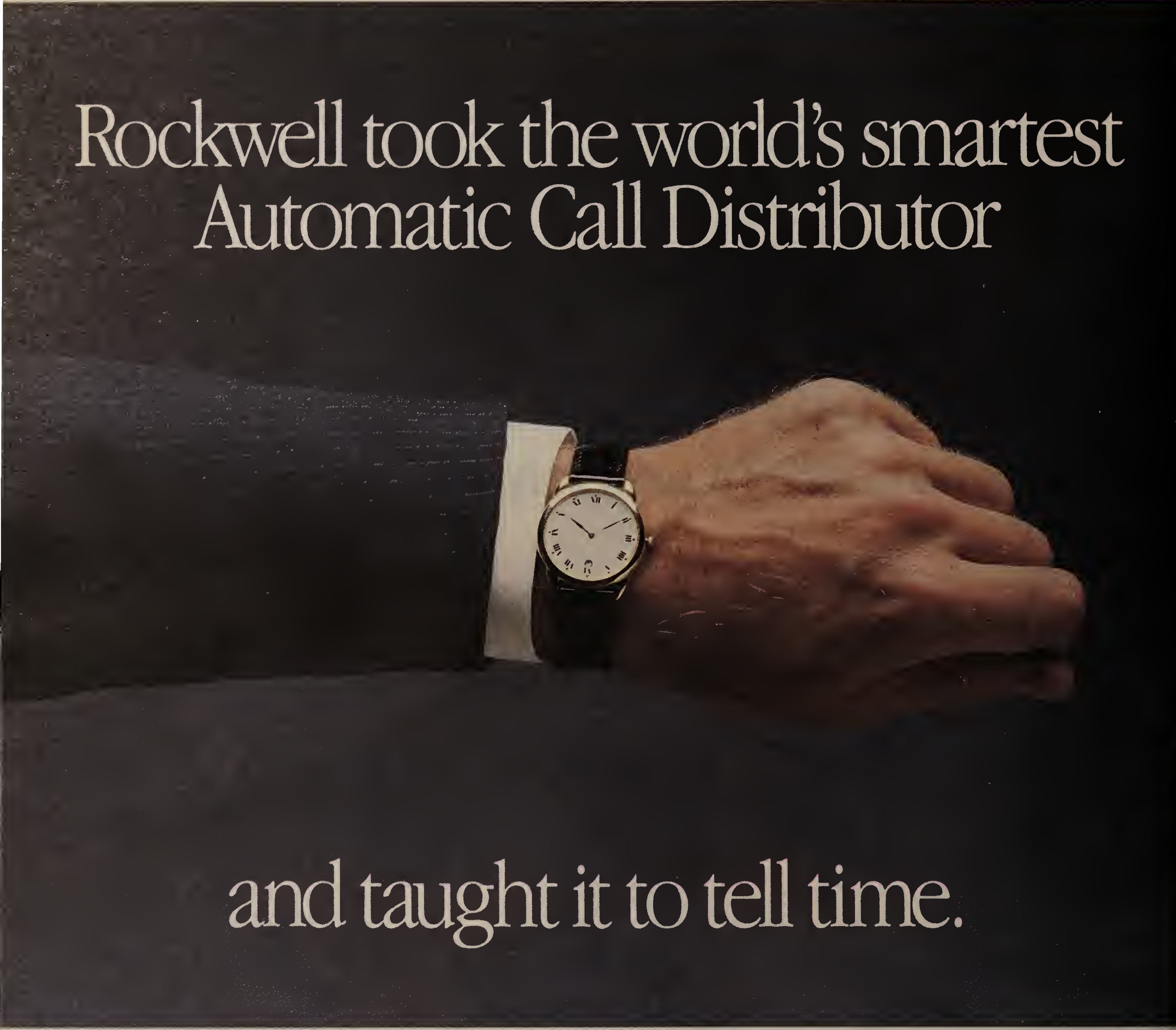
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TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

New York Telephone Co. last week withdrew a proposal to rent directory listings of business and residential customers to direct marketers after 800,000 customers told the telephone company they didn't want their names used. The state Consumer Protection Board and state legislators also raised objections to the undertaking.

Carrier Watch

Ameritech Services, Inc., market planner for the five Ameritech companies, has announced a six-month trial sales program in the Chicago area with Inacomp Computer Centers, Inc.

Under the agreement, salespeople at Inacomp Computer stores will sell a variety of **Illinois Bell Telephone Co.'s** packet-switched and private-line services. Inacomp will recommend the Hayes Microcomputer Products, Inc. V series modem line with the network services.

Hayes was instrumental in bringing Ameritech and Inacomp together. Ameritech will provide training for Inacomp sales employees.

Eight of the 13 nodes on the National Science Foundation's research network will be upgraded from T-1 to T-3 speeds by year end. In addition, three new sites will be added to the network.

The Massachusetts Institute of Techology's New England Academic and Research Network as well as the research network for the Argonne National Laboratories in Chicago will be added at T-3 speeds. The Georgia Institute of Technology's SURAnet in Atlanta will be added at T-1 speed. ☐

ANI outlook

A survey of *Network World's* User Advisory Panel	Yes	No	No answer	Uncertain
1. Is your company planning to use automatic number identification?	9	3	2	—
2. On a personal level, are you concerned that ANI represents an invasion of privacy?	4	9	1	—
3. Should telephone companies be required to offer free blocking of telephone numbers?	6	7	—	1
4. If carriers offer blocking, will that diminish the value of ANI to businesses?	11	3	—	—

GRAPHIC BY SUSAN J. CHAMPENY

C&P offers features for protecting caller identity

Options thwart ANI without requiring blocking.

By Ellen Messmer
Washington Correspondent

BALTIMORE — The Chesapeake and Potomac (C&P) Telephone Co. of Maryland, a local company of Bell Atlantic Corp., is proposing three ways for Maryland criminal enforcement divisions and social service agencies to protect the identity of callers by offering ways to circumvent caller ID services.

None of the three C&P solutions, however, offers call blocking because Bell Atlantic remains opposed to offering caller ID blocking, claiming it dilutes the usefulness of the service.

The blocking issue was central to a recent Pennsylvania court decision that barred Bell Telephone Co. of Pennsylvania — another Bell Atlantic company — from offering caller ID services.

At hearings before the Maryland Legislature earlier this year, Bell Atlantic promised to file a state tariff for certain agencies to use in thwarting caller ID. The solutions, filed with the Public Service Commission (PSC) of Maryland, offer three Special Identification Arrangements.

In the first solution, an agency line would be converted to have call-out capability only. Although the agency's number could be captured, any calls to the agency would be answered with a recorded message informing them that the agency could not accept calls to that number.

In the second recommendation, agency lines would be outfitted with IdentaRing capability, which enables one line to support two telephone numbers. Caller ID only recognizes the phone number of the primary number with IdentaRing, so agency use of the secondary number ensures the privacy of the caller.

The third solution would be to waive the 60-cent operator assistance surcharge for the calls to agencies placed through an operator. Caller ID cannot currently be captured from operator-assisted calls.

All three services will be offered free of charge. C&P Telephone of Maryland will contact agencies directly once the tariff is approved and the Maryland State Department of Human Resources draws up a list of certified agencies and directors.

Berge Ayvazian, a vice-president at The Yankee Group, a Boston-based market research firm, criticized Bell Atlantic's refusal to offer blocking for caller ID. "The blocking they want to offer to specialized agencies is not the form you could offer to all customers," he said.

In one recommendation, agency lines would have an IdentaRing capability.

▲▲▲

A Bell Atlantic spokeswoman said Bell Atlantic does not want to offer call blocking for caller ID because its effectiveness would be diminished if people making harassing phone calls could block identification of their calls. A spokesman for the the PSC of Maryland said the five-member commission will discuss the C&P Telephone of Maryland proposal as well as other concerns about caller ID at an administrative hearing on June 27. ☐

RBHCs ready on-line service mgmt. tools

Four of the Bell holding companies plan to roll out services based on BELLCORE Customate.

By Jim Brown
Senior Editor

Pressed by users for better tools to manage local services, four regional Bell holding companies are moving ahead with plans to offer on-line network management services based on software developed by Bell Communications Research.

The four RBHCs — Ameritech, Nynex Corp., Southwestern Bell Corp. and US West, Inc. — are at different stages in their rollout strategies, but each plans to file by year end tariffs to offer some form of on-line management service based on BELLCORE's Customate software. The four RBHCs funded the development of Customate.

The core Customate software runs on AT&T's line of 3B minicomputers and acts a gateway that enables customers to access management data stored on the computers the RBHCs use to operate their networks.

Customers can access the 3Bs via leased or dial-up lines using Digital Equipment Corp. VT-100 terminals or microcomputers emulating VT-100s. They can use menus to select the function desired or the data they wish to retrieve. Customate then retrieves the requested information from the RBHCs' internal management systems and assembles it in a format the customer can understand.

"Basically, what we're trying to do is make our internal systems transparent to our customers," said Phil Mikita, manager of new product development at Ameritech.

Because the RBHCs use disparate systems to manage internal operations, they must customize Customate to some degree, according to Marianne Fugita, director of network management services at US West.

The RBHCs said the first service they will provide using Customate is on-line access to trouble reporting systems. This will enable users to enter and track

(continued on page 14)

WASHINGTON UPDATE

BY ANITA TAFF

Nynex heads to court over Consent Decree. In an arraignment at the U.S. District Court for the District of Columbia, Nynex Corp. last week pleaded not guilty to charges that it violated provisions of the Consent Decree. The Department of Justice, which issued a criminal indictment against Nynex at the completion of a two-year grand jury investigation, asked the court to fine Nynex $1 million if the company is found guilty. Ray Burke, executive vice-president and general counsel of Nynex, asked the court for a jury trial but was denied by the Justice Department. Both sides will meet with U.S. District Court Judge Harold Greene on July 2 to work out a schedule for the trial.

Nynex is accused of willfully violating the information services restriction of the Consent Decree. The Justice Department said a Nynex subsidiary, Telco Research Corp., a telecommunications software firm in Nashville, allowed MCI Communications Corp. to access, process and store network design information in Telco Research's computers.

Users ask FCC to refine price cap provisions. Users last week continued to attack the Federal Communications Commission's price cap plan for local carriers, saying it was flawed and would hurt consumers if implemented. Users groups and carriers filed their final round of comments last week concerning the changes the FCC proposed to ease concerns that price caps will allow the local carriers to earn excessive profits at the expense of ratepayers.

Major users groups such as the International Communications Association (ICA) and the Ad Hoc Telecommunications

(continued on page 14)

RBHCs ready on-line service mgmt. tools

continued from page 13

circuit trouble reports, request circuit tests and view the results of those tests.

All but US West said their initial Customate-based services will allow customers to receive alarms when circuits fail or suffer from degrading conditions, as well as access traffic data histories so they can determine if they have enough circuits to support traffic loads. US West will add these services in later releases.

The companies said it will be at least a year before they can add other on-line services, such as order entry, billing data retrieval and access to the carrier's own network planning software.

BELLCORE said it is using Open Systems Interconnection protocols to build Customate links to integrated network management systems such as AT&T's Accumaster Integrator, IBM's NetView and Digital Equipment Corp.'s DEC Management Control Center Director. This will enable customers to merge telephone service management data with the rest of their network management data.

"We should be able to interface directly into an integrated net management system and let customers manage our network services through that system," said Phil Gamble, associate director of net management products at Nynex Service Co.

Southwestern Bell is the only one of the four RBHCs to offer tariffed Customate-based Network Management Services. According to Sue Carter, product manager for Network Management Services at Southwestern Bell, the company offers Customate-based services in each of the five states in its region.

Southwestern Bell is offering the services under custom contracts. "We are in the implementation stage now," Carter said. "We have customers with signed contracts, and we're getting them on-line."

The carrier is using Customate to provide access to an existing on-line management service that enables Centrex customers to reconfigure the service. The company also offers an on-line service not based on Customate that links customers to its internal billing system.

Southwestern Bell is using Customate to provide access to an existing on-line management service.

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Ameritech has gained regulatory approval to offer Customate-based services under the name of Ameritech Service Management System to customers of all its services in Illinois and Indiana. But Michigan regulators will only allow the company to offer the services to Centrex customers. Ameritech is waiting for regulatory approval to offer the services in Ohio and Wisconsin. It will use Customate to support a Centrex reconfiguration service.

US West and Nynex have not yet filed tariffs to offer Customate-type services but last week said they intend to file them by year end.

US West has finished trials of its Customate-based Network Info Bridge service and plans to file tariffs in August or September. The company will initially target users in Denver, Minneapolis and Seattle.

Nynex recently announced that customers in Boston and New York are trialing its Customate-based services called Network Services Manager. Nynex plans to file tariffs in New England and New York in the fourth quarter, and said it hopes to make Customate-based services available by February 1991. ◘

Washington Update

continued from page 13

Users Committee urged the FCC not to water down safeguards it added to the price cap plan. The FCC added provisions for an automatic stabilizer and sharing mechanism that would force the local carriers to reduce rates if their profits rose above a specified level. The conditions would also allow carriers to raise rates if the profits fell well below the 12% they now earn under rate-of-return regulation.

Even if the profit-sharing mechanism is kept in place, users insist that the price cap plan, as currently written, places inordinate risk on consumers while allowing carriers to reap excessive profits. Price caps will require the local carriers to keep future rate increases 3% below the rate of inflation. This means that prices will stay level only with 0% inflation. Both users groups said the figure must be at least 5%. If this is not done, the ICA claimed, ratepayers will pay $5 billion more over the first four years of price caps than under current rate-of-return regulation.

Despite criticism, the regional Bell holding companies filed comments last week indicating they believe price caps will benefit users. Some RBHCs lashed out at opponents who they claim are trying to impede the process rather than help develop a good regulatory plan that will benefit users and carriers alike. ◘

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FCC denies AT&T appeal to offer single discount plan for SDN, 800

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — The Federal Communications Commission last week rejected AT&T's plan to offer a unified volume discount plan that would let users combine Software-Defined Network (SDN) and 800 service traffic to qualify for larger savings.

The plan marked the first time AT&T had proposed a single discount plan covering different tariffed services. The carrier already offers discount plans for different services provided under a single tariff.

The unified plan would have enabled users to combine interstate and intrastate Megacom 800 service, standard 800 service and 800 Readyline service under an expanded volume discount plan for SDN.

An FCC spokesman called the plan patently unlawful. "By linking 800 service discounts to the customer's selection of AT&T as its [virtual network] carrier, AT&T is leveraging its significant advantage in the 800 market to gain an advantage in the [virtual net] market," he said.

In its plan, AT&T proposed a new Usage Reduction Plan that would have given users a 5% discount before any other discounts on SDN and 800 charges above $10,000 a month. Customers would also have been given discounts on combined SDN and 800 usage based on their monthly charges and length of commitment.

AT&T had argued that it lost business from Betz Laboratories, Inc., Greyhound Lines, Inc. and Zenith Electronics Corp. to rivals because the other carriers were able to offer more attractive pricing plans.

"We're disappointed that the FCC has rejected what we consider an innovative offering — one that customers want, one that is similar to what our competitors have been offering all along," an AT&T spokesman said.

AT&T prices new alternate routing features

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — AT&T recently revealed pricing for two Megacom 800 features designed to protect service users from outages such as the nine-hour crash that knocked out the carrier's services last January.

The two new routing features, Alternate Destination Call Redirection (ADCR) and Split Access Flexible Egress Routing (SAFER), were announced in April and are expected to take effect July 21, according to an AT&T filing with the Federal Communications Commission.

ADCR is targeted at customers with two or more call centers. The service enables AT&T to use its 4ESS switches to redirect calls to prespecified sites if the customer's primary site is swamped with calls or knocked out of service ("AT&T moves to safeguard 800 users," *NW*, April 9).

In the demand and revenue forecast portion of the FCC filing, AT&T predicted it will reroute 5.5 million messages and 15 million minutes of traffic between July 1, 1991, and June 30, 1992. AT&T expects revenues to reach $17 million.

ADCR is targeted at users with two or more call centers.

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In the following year, between July 1, 1992, and June 30, 1993, AT&T expects the Megacom 800 feature to be used to reroute 8.8 million messages, or about 24.21 million minutes of traffic, and revenues to increase to $27 million.

Customers must pay a $1,090 onetime charge per 800 number for ADCR.

SAFER

SAFER is designed for customers with a single call center supported by a T-1 access link. If the AT&T 4ESS switch serving the center cannot complete calls over the T-1 facility, calls are routed to another 4ESS and delivered over a separate T-1 trunk.

The secondary Megacom 800 central office must be within 400 air miles of the existing serving office.

Customers can also have multiple alternate central offices. Routing to two different Megacom 800 central offices requires an additional customer-provided access facility between that central office and the user's site.

Customers pay a onetime $1,090 charge per 800 number for SAFER.

AT&T predicted that this Megacom 800 feature will be used to reroute eight million messages, or 23 million minutes of traffic, between July 1, 1991, and June 30, 1992. The service is expected to produce $26 million in revenue during the period.

In the following year, July 1, 1992, through June 30, 1993, AT&T projects SAFER will be used to reroute 13 million messages or 36 million minutes of traffic and generate $42 million in revenue.

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

"All users are trying to get out of the manual management environment. They want more on-line access to information about their networks because they realize how critical networks are to their business."

Sue Carter
Product manager for network management services
Southwestern Bell Corp.
St. Louis

Data Packets

Hayes Microcomputer Products, Inc. will unveil at PC Expo in New York this week its Smartcom Exec communications software that will eventually replace its existing Smartcom II package.

Smartcom Exec is Hayes' mid-range software product, positioned between Smartcom EZ at the low end and Smartcom III. Smartcom Exec runs on DOS-based microcomputers and laptops with 512K bytes of random-access memory and supports most asynchronous modems that use Hayes' AT command set.

Additionally, Smartcom Exec works with modems that support the Enhanced Serial Interface (ESI), which speeds the transfer of data between a microcomputer serial port and an external modem. Hayes' implementation of ESI transfers data between the microcomputer and modem at up to 38.4K bit/sec.

Smartcom Exec includes a Hayes scripting language, called the Simple Communications Programming Environment, that enables users to automate repetitive tasks. It also includes terminal-emulation software that enables the microcomputer to act as a teletypewriter terminal, a Digital Equipment Corp. VT-52, VT-100 or VT-102, or terminals that support ANSI's Ansi.Sys standard, which is sup-

(continued on page 22)

Net mgmt. software for IBM hosts analyzes VTAM

Omegamon II is first to control VTAM software.

By Paul Desmond
Senior Editor

LOS ANGELES — Candle Corp. this week will introduce net management software for IBM mainframes that analyzes the performance of VTAM, enabling users to make adjustments that improve network performance.

Candle said its new software, dubbed Omegamon II for VTAM, is the first package that provides monitoring and control of IBM's VTAM software, which sets up sessions between applications or between applications and terminals.

Other network management tools — including IBM's NetView — do not actually control VTAM; they collect alarms sent to it by other devices.

Omegamon II for VTAM monitors virtual routes in a Systems Network Architecture network, provides statistics to help managers better tune the net for improved performance, analyzes buffers to determine appropriate VTAM buffer sizes and studies network response times.

The software runs on MVS mainframes. It is accessed from 3270-type terminals and supports a user interface compatible with IBM's Systems Application Architecture Common User Access specification. Although the product does not feed directly into IBM's NetView, a facility is provided that lets users hot-key between Omegamon II and NetView sessions, according to Mary Ann Armstrong, Omegamon II product manager.

One feature of Omegamon II is its ability to monitor virtual routes, which are logical connections between two subarea network nodes, such as a front-end processor and a mainframe running VTAM.

Omegamon II maps the virtual routes defined by VTAM programmers to SNA explicit routes, which are physical data paths. The product shows the data flows on each of the virtual and explicit routes, enabling programmers to identify problems and tune VTAM accordingly by adjusting buffer

(continued on page 18)

Westinghouse finds smart ways to save on fax costs

By Paul Desmond
Senior Editor

PITTSBURGH — Westinghouse Communications Systems is experimenting with several methods for transmitting facsimile traffic over its corporate network as part of an effort to take a bite out of fax transmission costs.

The effort has paid off handsomely, cutting fax transmission costs by $10,000 per month on one international link alone.

The company is also testing emerging fax technologies, including the use of Group IV fax machines as store-and-forward nodes for Group III machines, a technique that could prove to be an interim solution until Integrated Services Digital Network offerings are widely available to support Group IV fax.

Westinghouse Communications Systems, based here, is the Westinghouse Electric Corp. division that provides communications services for its parent's various divisions worldwide, according to Ralph Krichbaum, manager of technical planning for the division.

One way to cut fax costs, Krichbaum said, is to move fax traffic onto existing backbone nets.

That strategy is saving the company $10,000 monthly on a link between a Westinghouse backbone node in Brussels, Belgium, and three company sites in Saudi Arabia, Krichbaum said.

At the three Saudi sites, Group III fax machines can dial into a Republic Telcom Systems Corp. device that converts the analog signal into a digital data stream and packetizes it for transmission over a private 9.6K bit/sec X.25 link to another Republic Telcom device in Brussels.

That obviates the need for Westinghouse to transmit fax traffic between Brussels and Saudi Arabia over expensive dial-up lines.

The company is also looking to cut fax costs in the U.S., although it is taking a different tack to do so.

Westinghouse is using Group IV fax machines to accept traffic from multiple Group III fax machines. The Group IV machine converts an analog Group III signal into digital format and sends it over the corporate backbone at

(continued on page 22)

CAD Framework Initiative miniprofile

Formed: 1988

Members: Fifty-two companies that represent computer-aided design vendors and end users, including AT&T, Digital Equipment Corp., Hewlett-Packard Co., IBM, Motorola, Inc., NCR Corp. and Sun Microsystems, Inc.

Governing body: Nine-member board of directors elected from among member companies to one-year terms.

Goal: Develop specifications that CAD vendors can use to build applications that enable network-attached workstations from various vendors to easily share CAD data.

Administrative management firm: MP Associates, Inc., 7490 Clubhouse Road, Suite 102, Boulder, Colo. 80301

GRAPHIC BY SUSAN SLATER
SOURCE: CAD FRAMEWORK INITIATIVE, INC., BOULDER, COLO.

Group to demo CAD file transfer over net

Feat will show how distributed computing can provide interoperability between applications.

By Jim Brown
Senior Editor

ORLANDO, Fla. — A group of 20 computer-aided design vendors next week will demonstrate a method to transfer design data among dissimilar CAD applications without using file conversion software.

Scheduled for the Design Automation Conference here, the demonstration will reveal how distributed computing can be used to achieve interoperability between 30 different CAD applications.

In the demo, applications running on Unix-based workstations from Digital Equipment Corp., Hewlett-Packard Co., HP's Apollo Systems Division, IBM and Sun Microsystems, Inc. will transparently exchange electronic component design data over a Transmission Control Protocol/Internet Protocol-based network.

The demonstration will pave the way for completion of a specification that enables software developers to build support for remote procedure calls and other distributed computing technology into their CAD applications.

The specification is being developed by Boulder, Colo.-based CAD Framework Initiative, Inc. (CFI), a nonprofit group of 52 CAD vendors and end users.

When complete, CFI's specification will enable software developers to use a common set of programming interfaces and data formats to build data retrieval capabilities into their CAD products. These features will allow users of one application to request entire data files or components of a file from the data base of another application residing on the network.

Currently, users must rely on file conversion software supplied by each vendor or developed internally to convert data files extracted from one vendor's CAD data base to be used in another vendor's CAD analysis application.

This requires the user to move massive files — often containing gigabytes of data about millions of electrical parts — across a network to an analysis application. This application must then convert the file and search for the data needed to perform a design analysis.

> CFI's specification will enable developers to use a common set of programming interfaces.

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"In this industry, our customers are spending millions of dollars a year translating files back and forth in order to get this CAD tool to work with that CAD tool," said Robert Carver, CFI vice-president.

"We have been trying to define standard procedural interfaces or standard mechanisms that allow information to flow from CAD tool to CAD tool without any real explicit translation taking place," Carver said.

To satisfy that goal, CFI developed a prototype of what it calls a Procedural Interface (PI), a set of software routines vendors can insert into their CAD applications. These routines enable one

(continued on page 18)

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Group to demo CAD file transfer over net

continued from page 17

application to kick off a process on another application running on the same workstation. HP volunteered to add support for its Network Computing System (NCS) to the PI so that CAD applications could request data on disparate systems across a network.

NCS includes a remote procedure call that enables an application running on one computer to instruct an application running on another computer on the network to perform a task. However, CFI has not committed to using NCS in its PI.

The PI will let a vendor build a CAD analysis application that can extract data stored in the data bases of other vendors' design applications. The design data base can include information about the various electrical components used to make a circuit board, along with data describing how those parts are connected.

CAD analysis applications use that data to conduct tests that determine how an entire design or parts of the design will perform under simulated conditions.

Unlike current CAD packages, a PI-based analysis application will automatically generate data base queries in a CFI standard format.

Those queries then trigger a remote procedure call, which sends the data request across a TCP/IP net to another vendor's PI-based CAD design application. That application then converts the standard queries to its own data base format and processes the request.

Once data is retrieved, the PI-based design application converts it to a standard format and passes it back over the network to the PI-based analysis application. The analysis program then converts the standard data format to the format it uses.

CFI plans to demonstrate this process at the show. Once the demonstration is complete, CFI will resolve minor flaws uncovered in the PI during initial testing and then evaluate distributed computing technologies for inclusion in its specification.

Carver said that while CFI hopes to vote on a final PI specification in November, it could be as long as a year before the group announces which distributed computing technology it will recommend that vendors use when implementing the PI.

During this time, CFI will evaluate the Open Software Foundation's (OSF) Distributed Computing Environment standard, which was recently announced and is based on Apollo's NCS. CFI will also examine other alternatives such as Sun's Open Network Computing, which may become the basis for a distributed computing standard being developed by OSF rival Unix International, Inc.

A PI-based analysis application will automatically generate data base queries in a CFI standard format.

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"There is a very strong leaning toward OSF because they are a force to be reckoned with," said Neil Kenagy, a member of the technical staff at the CAD Framework Laboratory in Austin, Texas. "But we also have members that are from the Unix International camp." ◼

Net mgmt. software analyzes VTAM

continued from page 17

sizes or virtual route configurations, for example.

Omegamon II also provides buffer-pool analysis for various VTAM buffers. VTAM has multiple buffers that data must pass through, such as one that copies data from application buffers and another that stores data until it is ready to transmit, Armstrong said.

If the buffer sizes do not match the amount of data they are expected to handle, it can throw off VTAM's timing and take down some virtual routes. This type of condition won't show up on a net management system such as NetView because there is no perceptible hardware or application problem to report, Armstrong said.

Omegamon II also collects and displays VTAM statistics on data flowing between a mainframe and local channel-attached devices, such as a front end or cluster controller. The product provides the tuning statistics on-line in an easy-to-read format that helps users ensure that no single device is dominating the data flow.

The offering also provides end-to-end response-time monitoring, as does NetView. But Omegamon II reports response time according to subarea, meaning it can define which host owns a resource that is experiencing poor response time. NetView provides the overall response time, but the user has to determine which host owns the device. This prolongs problem resolution, Armstrong said.

Lawrence Chin, a member of the technical staff at Bell Communications Research in Piscataway, N.J., and a beta user of Omegamon II, said the response-time feature was redundant with Legent Corp.'s NetSpy software, already in use at his company. He said he liked the buffer-pool analysis feature; however, that feature was not enough to persuade him to keep the product after the test.

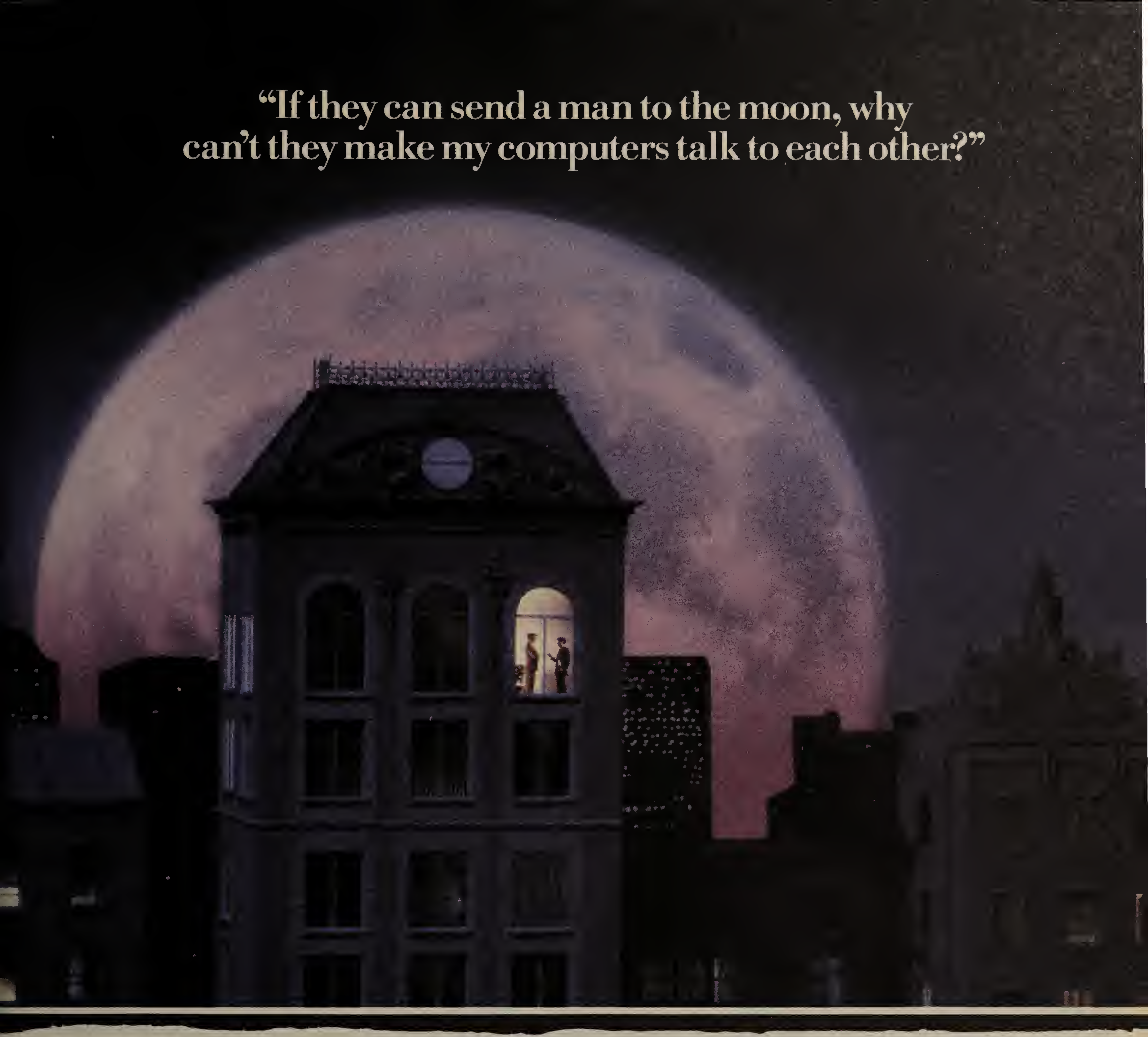
Another shortcoming, Chin said, was that the tuning data provided numbers but did not indicate what they meant. "It provided some metric, but I couldn't determine what it was trying to tell me," he said, adding that the product documentation was of no help.

Another beta-tester, George Hanson, a systems software specialist with Carter Hawley Hale Stores, Inc. in Anaheim, Calif., said Omegamon II helped him identify an application that was chewing up an inordinate amount of VTAM buffer space.

In addition, he said the virtual route analyzer has proven to be a valuable tool because it provides the status of the routes in real time. IBM, in contrast, has a facility dubbed Network Traffic Analysis that users can employ to identify problems by running a trace after the problem has occurred and then feeding the trace data to the IBM application, Hanson said.

"Before we had this, we could have a node that just locked up," he said.

Omegamon II for VTAM is available now. It is priced between $24,000 and $60,000 for the first copy, depending on processor type. Additional copies cost half as much as the first. ◼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Data Packets

continued from page 17

ported by many on-line bulletin boards.

Smartcom Exec also includes file-transfer software that supports the Xmodem and Kermit protocols.

Smartcom Exec is expected to be available in July for $129. Smartcom EZ users can upgrade to Smartcom Exec for $55, while users of Smartcom II can upgrade to the product for $35. Hayes said it will stop selling Smartcom II in July 1991 and cease supporting it in July 1992.

CompuServe, Inc. last week announced an agreement with **Fujitsu, Ltd.** to link the two vendors' public packet networks, giving CompuServe users more direct access to sites in Japan.

CompuServe's net will be linked to Fujitsu's new Fujitsu Enhanced Information and Communications Service (FENICS) II network, which serves users in nine major Japanese cities with 2,400 bit/sec dial-up access.

Currently, CompuServe customers can access Japan via gateways to other value-added nets, but the Fujitsu agreement is expected to provide a more direct and less expensive link.

When the vendors' link goes into service in September, users will be charged a flat rate of $16 to $20 an hour for unlimited transmissions. Through the gateways that exist today, that rate ranges from about $25 to $50 an hour, according to CompuServe.

MCI Communications Corp. recently said that users of Hewlett-Packard Co.'s X.400-based software products can transmit electronic mail over the MCI Mail XChange 400 network.

MCI said it has completed interoperability testing with the HP 3000 minicomputer-based HP X.400/HP Desk software. The HP software works in conjunction with HP Server X.400, an X.400 gateway package that runs on an HP 9000 Unix-based workstation and allows HP Desk E-mail users to send X.400 messages.

The carrier also said HP X.400/9000 software can interconnect with its service. HP X.400/9000 lets users of HP OpenMail — or other Unix E-mail packages supporting a "Send Mail" function — exchange mail over the carrier's X.400 service.

X/Open Co., Ltd. recently launched a new program to identify open systems that have passed at least 5,500 different conformance tests to prove compatibility with the X/Open Portability Guide (XPG3) specifications for a vendor-independent operating environment.

XPG3 specifications are aligned with international and de facto industry standards, including the IEEE 1003.1 Portable Operating System Interface standard for portable programming interfaces, parts of the Open Systems Interconnection seven-layer model, X Window System and SQL.

Users can be assured that any products carrying the X/Open seal of approval will interoperate, according to an X/Open spokesman.

The products are tested against the X/Open XPG3 Verification Suite, which will continually be enhanced as part of a joint effort with the National Institute of Standards and Technology, the Open Software Foundation and Unix International, Inc.

Products from 12 U.S. and European vendors have already been awarded the XPG3 brand.

These vendors are: AT&T Computer Systems, AT&T Unix Software Operation, Digital Equipment Corp., Group Bull SA, Hewlett-Packard Co., IBM, ICL, Inc., Olivetti USA, Sequent Computer Systems, Inc., Siemens AG, Sun Microsystems, Inc. and Unisys Corp. ▣

Westinghouse finds ways to save on fax

continued from page 17

56K bit/sec to another Group IV machine at the remote site. That machine converts the digital format back to analog and forwards the message to a Group III fax in user work group areas.

Westinghouse is testing this setup at sites in Charlotte, N.C., Orlando, Fla., and corporate headquarters here. The idea is to cut fax transmission costs between the sites. Those costs exceed $5,000 monthly for the 15,000 pages transmitted between Orlando and Charlotte alone, Krichbaum said. "It's conceivable that you could, long-term, set it up like a telephone network. Group IVs would be just big store-and-forward switches, and you would spot them strategically across the country to minimize your fax bills," he said.

Potential stumbling block

One stumbling block to that effort, however, is that there is no standard for passing signaling information between Group III and Group IV fax machines. Group III machines use analog tones for signaling, while Group IV machines use digital bits.

Another problem is that the machines that have enough intelligence to handle such an application are expensive; they start at about $40,000, Krichbaum said. Other emerging services, namely ISDN, will support less expensive Group IV machines with the same benefits of greater speed and clarity.

"As ISDN becomes universally available, I think you'll get everybody into [Group IV fax]," Krichbaum said. "By the turn of the century, Group III machines will be like Group II machines are today; there are still a few out there."

Today, users can fax a standard-size document over an ISDN link using Group IV fax for about one-fourth the cost of sending the same document over dial-up lines using Group III fax, he said. ▣

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LOCAL NETWORKING

PC AND TERMINAL-TO-HOST LANS, GATEWAYS AND MICRO COMMUNICATIONS PRODUCTS

Worth Noting

"Novell's NetWare 386 V. 3.1 Comm Server software saves users the trouble of exiting NetWare and running terminal-emulation sessions or using a gateway to access other hosts and applications on a LAN. The strategy is brilliant; now Novell must deliver on its promises."

Mary Modahl
Director of the Network
Strategy Service
Forrester Research, Inc.
Cambridge, Mass.

Netnotes

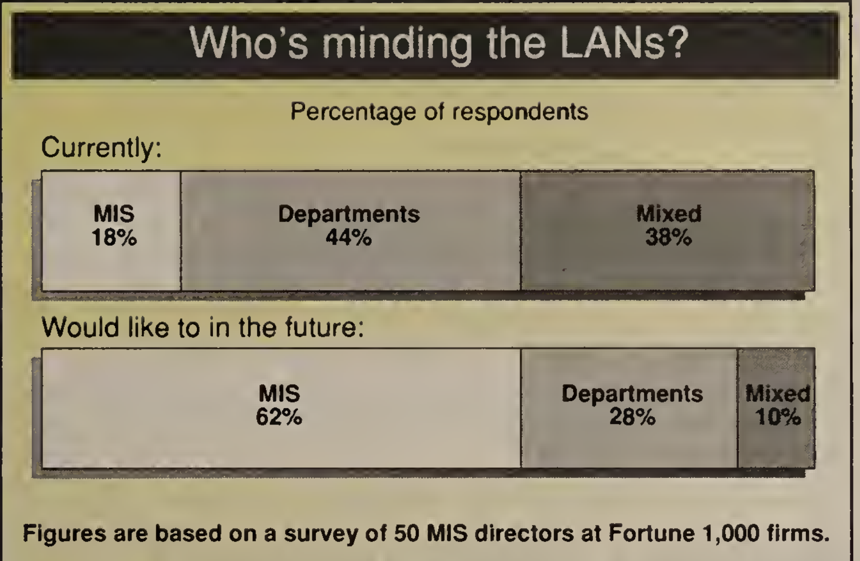
Advanced Computer Communications (ACC) is scheduled to enter the local bridge market this week with the introduction of the ACS 2100, a stand-alone device that can support sustained throughput of 12,500 packets per second.

The bridge comes with connectors for both thick- and thin-wire Ethernet media, and it supports the Simple Network Management Protocol and the IEEE 802.1 Spanning Tree Protocol. The latter disables alternate routes in internetworks designed with redundant links and automatically enables them if the preferred connection fails.

According to Gary Krall, ACC's marketing director, the company plans by late summer to enhance the ACS 2100 with routing software that users will be able to download into erasable programmable read-only memory in the unit. The initial release will support Transmission Control Protocol/Internet Protocol routing, with support for other protocols to follow, Krall said.

Priced at $3,450, the ACS 2100 is available now.

ACC can be contacted at 720 Santa Barbara St., Santa Barbara, Calif. 83101, or call (805) 963-9431.



Figures are based on a survey of 50 MIS directors at Fortune 1,000 firms.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

SynOptics supports FDDI over shielded twisted pair

Slashes FDDI desktop connection cost by 60%.

By Laura DiDio
Senior Editor

MOUNTAIN VIEW, Calif. — SynOptics Communications, Inc. last week said it has developed a way to substitute shielded twisted-pair wire for fiber-optic cable runs to user desktops in 100M bit/sec Fiber Distributed Data Interface local-area networks.

Use of IBM Type 1 shielded twisted pair to link desktops to wiring closets instead of the more expensive fiber could lower FDDI connection costs by 60% or more, according to Michael Clair, SynOptics' vice-president of marketing and sales.

It currently costs about $11,650 for a single FDDI desktop workstation connection using fiber-optic equipment, including cable, adapter, connector and intelligent wiring hub, according to Forrester Research, Inc., a Cambridge, Mass., market research firm. Forrester Research predicts that this price will drop to $2,000 by 1994 as the demand increases and the market matures.

Clair contends that SynOptics' technology breakthrough — which it will present at this week's ANSI X3T9.5 FDDI quarterly committee meeting in Wichita, Kan. — will enable it to support the full 100M bit/sec speed and throughput of FDDI over standard shielded twisted-pair wiring, thereby lowering connection costs.

"Using shielded twisted-pair wiring, we can now cut the cost of bringing FDDI to the desktop down to $4,000 per connection," Clair said. "This means that users won't have to wait for four years for the price to drop to the point where FDDI is a viable desktop technology for midsize users. Right now, only the largest users, such as brokerage houses, can afford the cost of FDDI at the desktop."

SynOptics will incorporate its shielded twisted-pair support for FDDI into its existing LattisNet System 3000 intelligent hub within the next six months, Clair said. Additionally, he said, SynOptics will propose that its technology be incorporated as an alternate transmission standard in the ANSI X3T9.5 FDDI specification.

SynOptics' shielded twisted-pair FDDI transmission scheme conforms to both the ANSI TR41.8 and the IBM cabling system specifications, which require a maximum distance of 330 feet, or about 100 meters, from the wiring closet to the desktop, Clair said.

> "Right now, only the largest users can afford the cost of FDDI at the desktop."

▲▲▲

He also noted that SynOptics has engineered its technology to be fully compliant with the three already completed hardware portions of the standard — the media access control layer, physical layer and physical medium dependencies layer.

"It's a fail-safe product," Clair said. "Everything we've done is in full compliance with the standard. We're simply proposing an alternate transmission mechanism engineered according to the X3T9.5 standard, which replaces fiber-optic components with less expensive copper-based [shielded twisted-pair] wiring.

"We're confident that once we

(continued on page 24)

Interoperability top priority for vendors

Traditional Comdex battle between LAN system players replaced by newfound spirit of glasnost.

By Susan Breidenbach
West Coast Bureau Chief

ATLANTA — The traditional "Battle of the Network Operating Systems" session at the recent Comdex/Spring here was more of a love-in than a battle, as representatives from six of the largest local-area network players sought to convince the audience that network interoperability has become their top priority.

It was a far cry from the same panel discussion two years ago, when IBM's representative challenged a Microsoft Corp. contention that its LAN Manager product would be interoperable with IBM's LAN Server and the Novell, Inc. contingent sat there trying to hide a smirk.

But in 1990, glasnost is the order of the day. Panel members from Banyan Systems, Inc., Digital Equipment Corp., IBM, Microsoft, Novell and 3Com Corp. agreed that the user community has forced the interoperability issue.

"What's interesting here is that the industry has changed," said panel moderator Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "Everyone's realizing that they have to coexist. You'll never see 'battle' in the title of this session again."

The interoperability push has been strong enough to move even IBM. "Our customers are telling us they want interoperability, whether it's an IBM or non-IBM

(continued on page 24)

UB 10BaseT adapters act as protocol processors

By Laura DiDio
Senior Editor

SANTA CLARA, Calif. — Ungermann-Bass, Inc. last week introduced two 10BaseT-compliant intelligent network adapters that double as protocol processors and software drivers for the adapters supporting Novell, Inc.'s Open Data Link Interface (ODI) for NetWare 386 servers and OS/2 workstations on NetWare LANs.

The Ethernet adapters, the NIUpc/Ethernet on Twisted Pair (NIUpc/EOTP) and the NIUps/EOTP can be used in machines with 16-bit IBM Personal Computer AT buses or Micro Channel Architecture buses. The boards support a variety of media, including thin and thick coaxial cable and twisted-pair wire, in compliance with 10BaseT.

Both the NIUpc/EOTP and the NIUps/EOTP are equipped with an Intel Corp. 80186 microprocessor and feature 512K bytes of on-board random-access memory, which can be upgraded to 1M byte, and 32K bytes of addressable memory.

The adapters function as protocol processors, capable of loading and executing entire network protocol stacks, explained William Moore, Ungermann-Bass' product line manager for workstation products. This frees the personal computer's CPU and memory to run applications.

The complete Transmission Control Protocol/Internet Protocol stack, the Network Basic I/O System stack and network management software all reside on the adapter, Moore said.

The ability to execute protocols directly on the adapter is especially important in an MS-DOS environment where standard protocols can consume from 128K to 512K bytes of the already limited 640K bytes of DOS system memory, Moore noted.

"Users are beginning to realize that PC performance and capacity problems on heavily used LANs are often a direct result of the strain put on the PC's CPU and memory by network overhead," Moore said. "The NIUps/EOTP and the NIUpc/EOTP off-load the network tasks into their own memory and processors, leaving the PC to support applications."

The NIUps/EOTP and NIUpc/EOTP also have resident network management software that monitors and reports data-link-level statistics such as the number of data packets sent and received. The net management software also provides network administrators with session-level statistics for TCP/IP and NETBIOS LANs on usage and event logging. It is compatible with the Simple Network Management Protocol.

(continued on page 59)

FDDI supported over shielded twisted pair

continued from page 23

explain the technology and demonstrate it, the X3T9.5 Committee will embrace it," he said.

Replacing optical with off-the-shelf

While Clair declined to divulge specific engineering details, he did say that SynOptics has found a way to eliminate the electro-optic components with off-the-shelf electronic parts. The optical components account for the largest expense in FDDI products.

"We've replaced the elecro-optic components with standard drivers, which will move the data across the shielded twisted-pair wire at the same 100M bit/sec speed," Clair said.

SynOptics will license its shielded twisted-pair specifications free of charge to FDDI chipset and adapter vendors.

The availability of the SynOptics specifications will enable these companies to build FDDI adapters, connectors for desktop-to-desktop and desktop-to-hub FDDI connections.

"They'll sell the adapters and connectors that support FDDI transmission over shielded twisted pair, and we'll incorporate the same support into our LattisNet System 3000," Clair said. The LattisNet hub also supports Ethernet, token-ring and fiber-optic FDDI transmissions.

"The economics lean toward the proliferation of the IBM Type 1 shielded twisted-pair cabling because it's so much cheaper and prices will continue to decline as the market matures, but we'll support both fiber optic and twisted pair," Clair said.

Similarly, Chipcom Corp. of Southborough, Mass., announced plans last week to support FDDI to the desktop over shielded and unshielded twisted pair, according to Dave Fowler, the company's vice-president of marketing.

Chipcom made only a technology announcement, however, and did not present product availability dates or pricing. The company will also present its technical details about FDDI over twisted pair at the ANSI X3T9.5 committee meeting this week with the hope that a working group will soon be established, Fowler said.

Interoperability top priority for vendors

continued from page 23

network, and we intend to have the best interoperability in the industry," said Charlie Brown, an IBM LAN product manager.

Brown pointed out that during the past year, IBM buried the hatchet with Microsoft when the two companies agreed to merge their respective LAN Server and LAN Manager offerings into compatible products. IBM also added support for Ethernet drivers to LAN Server to complement its traditional Token-Ring drivers.

This merging of LAN Manager and LAN Server environments implies interoperability between IBM and DEC. "We are a licensee of LAN Manager, so we will have full compatibility with LAN Server within 18 months," said Gail Daniels, director of local-area network marketing at DEC.

The rapprochement between IBM and Microsoft isn't too startling since the companies were allies to begin with. A more dramatic change in the industry has been the detente between Novell and 3Com.

"It's very important for people to understand that 3Com products are compatible with what Novell is doing with their operating system," said Alan Kessler, a 3Com vice-president and general manager. "We will have a product that allows workstations to connect to any NetWare server and any LAN Manager server for the purpose of running Novell-specific applications and copying files between the environments.

"We're working very hard to reduce the boundaries [between NetWare and LAN Manager] so you don't have to work your way through the excruciating decisions of 'Do I do this network operating system or that one, and what happens if I've made the wrong choice?' " Kessler said.

To relieve users of such worries, it's mandatory for all networking vendors to improve the level of interoperability among their products, both at the client and at the server level, said Mike Murray, general manager of Microsoft's network business unit.

While users are certainly clamoring for interoperability, the embrace of Novell by its competitors is partly due to NetWare's huge market share, which Communications Network Architects' Dzubeck estimates is 74%.

There is so much NetWare installed that vendors seeking to offer enterprisewide networking solutions have to figure out ways to integrate it, said David Williams, director of strategic marketing at Banyan.

In the long run, though, both IBM and Microsoft say that NetWare will start to get in the way of distributed computing. "We feel that having a common operating system environment and set of [application program interfaces] across both the client and server on the LAN is very important," IBM's Brown said.

Meanwhile, Murray said he hopes to see increased cooperation between Microsoft and Novell on the interoperability front.

"I would like nothing better than to work directly with Novell on this issue, rather than using third parties as intermediaries for providing [Server Message Block] support on a NetWare server or [Network Control Program] support on a LAN Manager server," he said.

"Keeping with the glasnost analogy, first we have to sign things like trade agreements, then we'll go to troop withdrawals, and we'll finally proceed to missile disarming," Murray said.

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Multiple segments and rings in same hub?	✓	No	No	No
Ethernet, Token Ring and LocalTalk in same hub?	✓	No	No	✓
Full redundancy?	✓	No	No	No
SNMP based Network Management?	✓	✓	✓	No
FDDI shipping now?	✓	No	No	✓
Typical price per port (with network management)	$364-$701	$454-$883	$574-$1569	$990-$2200

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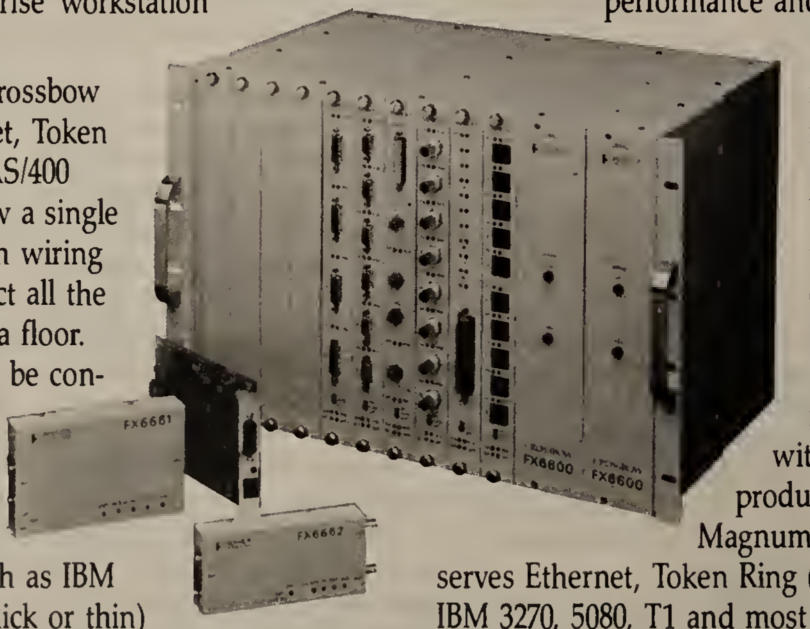

For one thing, Crossbow supports Ethernet, Token Ring, and IBM AS/400 connections. Now a single Crossbow in each wiring closet can connect all the workstations on a floor. Workstations can be connected using unshielded twisted pair, shielded twisted pair (such as IBM Type 1), coax (thick or thin) or optical fiber. And it's easy to link hubs together with fiber or copper cable to network thousands of workstations.

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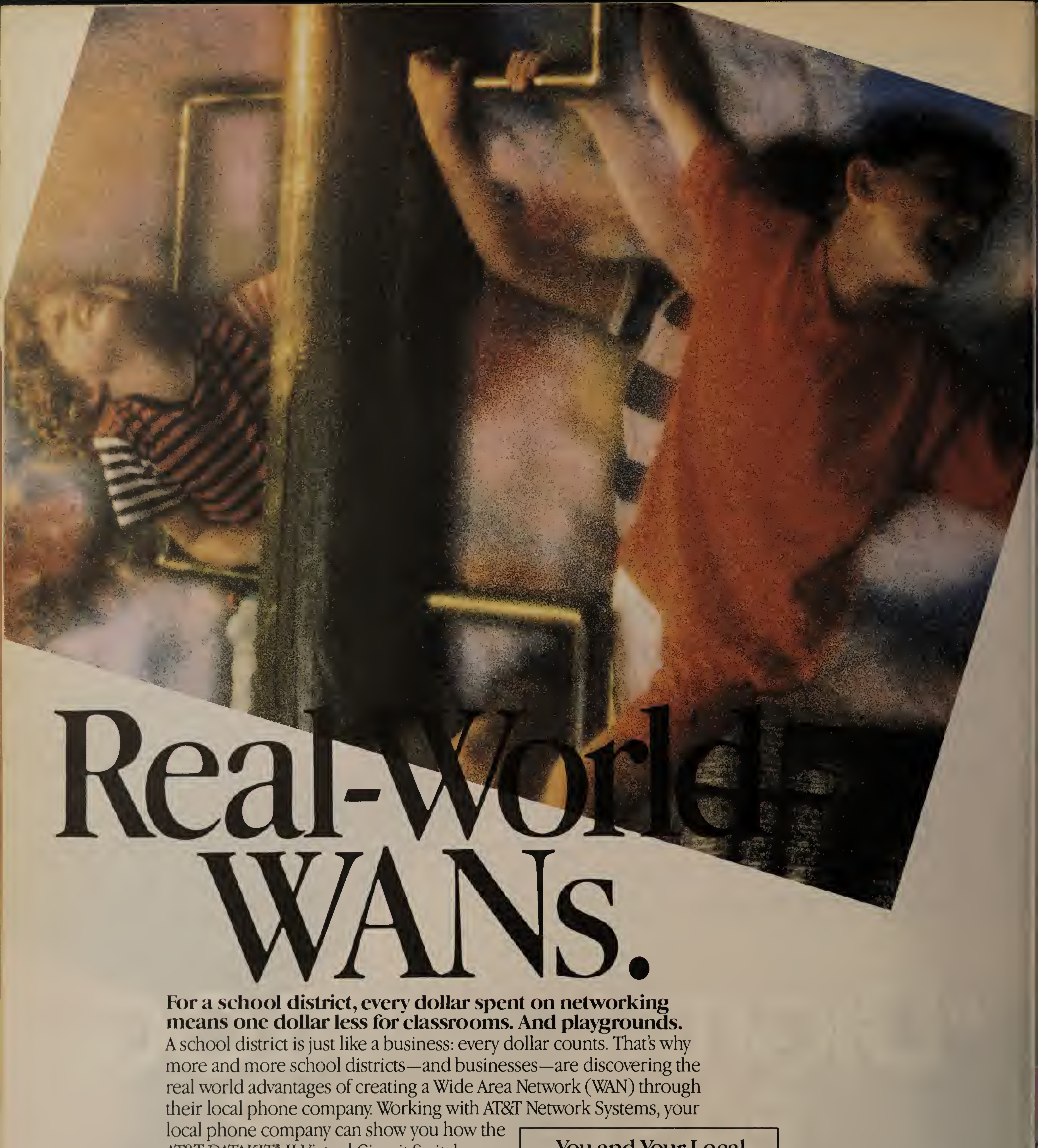

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Dialogue

Is it wise to use a call aggregator at a time when the major carriers are trying to curtail the scope of the aggregators' activities?

"Even though AT&T has changed its tariffs to minimize the advantages for aggregators, there is still good reason to use one.

"We use an aggregator as a kind of service bureau to handle our billing. In the long run, aggregators will end up playing this kind of role.

"AT&T's new tariffs provide us with much bigger discounts than in the past. But there are hidden costs in dealing directly with a carrier. You have to hire people to look after the billing, for example.

"A service aggregator does all this for you and lets your staff focus on more important strategic projects."

Bill Hider
Vice-president of telecommunications
Gannett Co., Inc.
Arlington, Va.

"We have ignored the aggregators. They are just another group to deal with. We prefer to deal directly with our service providers, with whom we have good relationships. The carriers provide us with excellent service and support, and favorable pricing."

Stephen Carnilla
Director of telecommunications
University of Chicago

"I look at aggregators the same way as carriers. Right now, I wouldn't make a long-term commitment to a carrier or an aggregator because it's too risky. If I get locked into something, I have no flexibility.

"Also, prices are still coming down for digital services. Today's great discount could be tomorrow's standard pricing."

Jeff Hafer
Telecommunications manager
GPU Service Corp.
Reading, Pa.

"Carriers definitely let you know that aggregators are an alternative, but they definitely don't want you going that way if they can help it.

"You're going to get better responsiveness from carriers if you deal with them directly."

Bernie Schneider
Director of telecommunications
United Stationers, Inc.
Des Plaines, Ill.

Multicarrier strategy helps insurers improve networks

Leveraging carriers boosts uptime, cuts costs.

By Tom Smith
New Products Editor

Two top insurance firms said recently that aggressively managing multiple carriers has helped them ensure maximum network availability and reduce long-distance rates.

Representatives of Nationwide Insurance Co. and ITT Hartford outlined their multiple-carrier strategies at the recent Insurance Accounting and Systems Association conference in Anaheim, Calif.

Both companies said using multiple carriers allows for diverse routing and lets the companies leverage competition for price and service advantages. They also advised users to outline stringent price/performance requirements in their dealings with long-haul carriers.

At Nationwide, aggressive management of AT&T and MCI Communications Corp. has aided the company's effort to maintain 99.9% availability on its data network, which consists of 56K bit/sec leased lines connecting 17 regional offices.

This level of uptime is necessary to support the 1.5 million daily IBM IMS/CICS transactions on the insurer's net, according to Kreig Babbert, manager of network services and information systems services at the Columbus, Ohio, company. He said the company estimates that one hour of downtime in a regional office costs $1,900 in lost productivity.

For these reasons, Nationwide mandates that carriers ensure 99.9% availability and a mean time of 2½ hours to resolve a problem. The company initiates an "outage escalation procedure," whereby increasingly higher levels of management at the carriers and at Nationwide are notified of a problem as time progresses.

For example, if a problem has not been rectified after four hours, carrier and Nationwide vice-presidents are apprised of the situation, Babbert explained.

To monitor and maintain adherence to its standards, Nation-

(continued on page 28)

BOOK REVIEW

BY ERIC SCHMALL

How to influence others without being deceitful

Influence Without Authority, Allan Cohen and David Bradford (New York: John Wiley & Sons, 1990), $19.95.

Network managers who have little or no ability to influence others will have a difficult time making a mark in their professional career. *Influence Without Authority* is a book that demonstrates ways managers can influence subordinates, peers and even their own bosses without resorting to manipulation and deceit.

Authors Allan Cohen and David Bradford, professors of business at Babson College in Wellesley, Mass., and Stanford University's Graduate School of business, respectively, show how managers can achieve their goals using a "win-win" approach to dealing with other professionals. The authors effectively illustrate their points using fictional case studies in which managers attempt to influence others.

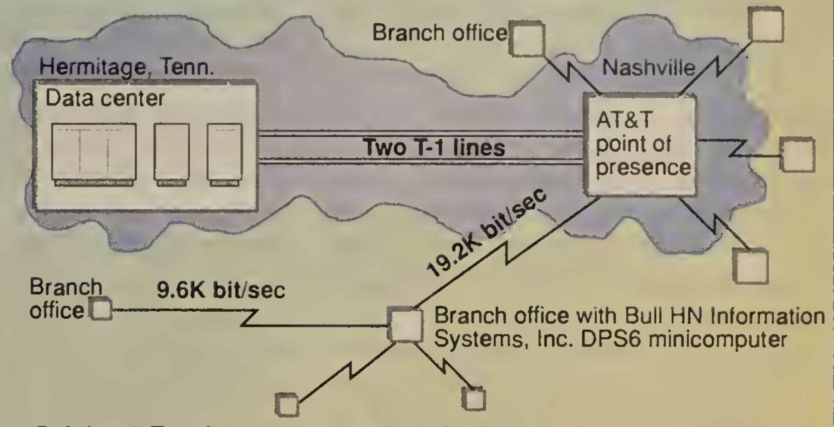
The authors emphasize that managers should seek to establish alliances with people they may want or need to influence. These alliances are built on mutual trust and respect, not fear or intimidation. Managers should openly show respect for the intelligence and competence of others and eagerly solicit their opinions on network projects.

In addition, the authors emphasize that managers should leverage their resources to establish mutually beneficial exchanges with others. They iterate the principle that "power comes from having access to resources others want." Network

(continued on page 28)

Schmall is a network systems manager for an insurance holding company.

Deloitte & Touche's X.25 net



Deloitte & Touche uses a star-shaped private packet network that enables about 170 branch offices to transmit data to mainframes in the firm's data center.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: DELOITTE & TOUCHE, RALEIGH, N.C.

Teamwork helps net pros manage merger

Cooperation is the watchword in the integration of accounting giants' disparate national nets.

By Wayne Eckerson
Senior Writer

RALEIGH, N.C. — Network managers at Deloitte & Touche know that cooperation is the key to integrating disparate networks after a merger.

Last summer, executives at Deloitte Haskins & Sells and Touche Ross & Co. announced that the accounting and consulting firms were joining forces to form a $4 billion international company, now called Deloitte & Touche.

Shortly after the announcement, a group of eight communications, data processing and administrative managers from the two companies met to hash out the details of merging their networks and administrative information systems.

From the start, the members of this technology transition team agreed to act as if they were from a single company. To reinforce this behavior, anytime managers mentioned they were from one firm or the other, they were fined $5.

"We realized we were in this together, and that made things go very smoothly," said Paul Prasek, a senior manager in the information technology practice at Deloitte & Touche here.

Within 60 days, the transition team had devised a complete migration strategy. Earlier this month, the two companies finished integrating their networks and consolidating back office operations in cities throughout the U.S., just six months after work began, Prasek said. Deloitte & Touche now has about 170 offices nationwide.

Jumping on the bandwagon

As part of the merger agreement, Touche Ross, which operated a dial-up network, agreed to shift its network traffic onto Deloitte Haskin & Sells' new X.25 packet network.

Deloitte Haskins & Sells' network, which came on-line a week before the merger announcement, consists of point-to-point 19.2K bit/sec leased lines, which connect 40 of the firm's larger branch offices to an AT&T point of presence in Nashville. Data traffic is routed across two T-1 lines from the AT&T site to Deloitte's data center in Hermitage, Tenn., a Nashville suburb.

About 50 smaller regional offices are linked to one of the 40 branch office hubs via dial-up lines or 9.6K bit/sec circuits (see graphic).

Each of Deloitte's 40 major branch offices are outfitted with a Bull HN Information Systems, Inc. DPS6 minicomputer, which processes payroll, accounts payables, accounts receivables, and time and expense reports submitted by consultants. The smaller offices feed data to the minicomputers for processing.

At night, the minicomputers upload summary information to one of several Honeywell, Inc. DN8 front-end processors in the Nashville data center using X.25 protocols. The front-end processors then send data to the mainframes or route it to another branch office.

In contrast, Touche Ross has about 80 offices nationwide that use stand-alone microcomputers to process financial data and handle other applications. Periodically, Touche Ross administrators would upload summary data via dial-up links to the firm's IBM mainframe in New York.

The big question facing the

(continued on page 28)

Teamwork helps net pros manage merger

continued from page 27

technology transition team was whether Deloitte's network had enough capacity to handle data traffic from both companies, about double the amount the network was originally designed to handle.

After an extensive study, the group determined that Touche Ross would only add about 15% more traffic to Deloitte's network. Most of the processing would be handled locally by the minicomputers, and file-compression techniques would minimize the increase in data traffic flowing to the data center.

While file transfers to the mainframes would be larger, Prasek said Deloitte's network was built with sufficient capacity to handle the extra load for several years.

Next, the group had to grapple with how best to migrate Touche Ross offices onto the Deloitte network.

In cities with a Touche Ross and Deloitte office, administrative and data processing operations were consolidated in one or the other's location, depending on what local managers decided, Prasek said. If operations were consolidated in an existing Touche office, then a leased line was installed to link the facility to the Nashville data center. The leased line to the Deloitte office was then taken down.

In locations where no Deloitte office existed, the group decided to use a mix of leased and dial-up lines to link Touche Ross offices to the Nashville site. Eventually, most Deloitte & Touche offices in a given city will be consolidated into one building, Prasek said.

Until then, offices that are not linked to the Nashville data center will hand-deliver time and expense reports to other Deloitte & Touche offices. At these sites, the data will be keyed into the system and uploaded to the data center.

The group also decided to move Touche Ross' IBM mainframe from New York to Deloitte's data center and link the mainframe to Deloitte's Bull mainframes.

The two companies had little difficulty merging their staffs, Prasek said. In moving its data center from New York to Nashville, Deloitte Haskins & Sells lost many of its employees, who decided to leave the company rather than transfer to Tennessee. This forced the company to hire almost an entirely new staff to man the Nashville operation, leaving Touche Ross people to fill many of the senior DP and communications positions.

Because many of the people who run operations at consulting companies such as Deloitte & Touche are also consultants, they typically agree to do one- to two-year stints managing the company's internal operations. As a result, they are apt to be less territorial and defensive than managers in most companies because they will only be around for a short time, Prasek said. ◼

Tips for handling net mergers

Merging the networks of two separate companies is never easy, but network managers can do several things ahead of time to make the task less formidable, according to Paul Prasek, senior manager at Deloitte & Touche.

Prasek was one of eight members of a technology transition team that planned the integration of the network and back office functions of Deloitte Haskins & Sells Co. and Touche Ross & Co. when the two accounting firms merged operations last year (see "Managers outline net merger strategy," page 27).

Prasek's advice to net managers planning for a merger is:

- Keep an up-to-date inventory of all network components — such as leased lines, terminals, multiplexers and phone sets — and their locations. "You need a roadmap to know where you are going during a merger," Prasek said.
- Have accurate information about network capacity and the factors that affect it, Prasek said. Network managers should keep track such things as the applications running on the network, the size of file transfers and the number of network users.

This information lets managers in a merger situation determine whether one company's net has enough capacity to support the other's net traffic.

- Standardize the use of technology across the network, if possible. Employing the same terminals and private branch exchanges, for example, simplifies the integration process when multiple locations are involved.

This enables the technicians responsible for making the wiring and equipment changes to finish the job quicker.

— *Wayne Eckerson*

Multicarrier strategy helps improve nets

continued from page 27

wide meets on a quarterly basis with carrier representatives to assess the carriers' responsiveness.

Nationwide's proactive approach to network availability includes use of three integrated network management systems: AT&T's Accumaster Integrator, Systems Center, Inc.'s Net/Master and IBM's NetView.

"As soon as an outage occurs and a map turns red, we start calling the vendor," Babbert said. "We keep on top of the vendors until it's resolved."

Babbert explained that his performance is rated according to a standard of 99.95% network uptime — compared to the 99.9% required of carriers — so the company has taken other steps to improve reliability.

For example, the company uses switched 56K bit/sec services as a backup to its leased lines. Switched 56K bit/sec service can be activated within three to five minutes of a circuit failure, minimizing the impact of an outage.

The company achieved 99.95% uptime in 1989 and 99.98% uptime to date this year, Babbert said.

Maximum network availability is not the only motivation for using and aggressively managing multiple carriers.

ITT Hartford's costs for its telecommunications network are expected to drop a total of 21% from 1987 to 1991, according to Richard Sidlauscus, senior systems specialist for the Hartford, Conn.-based insurer.

He said ITT Hartford, like many other large users, has been the beneficiary of 60% cuts in long-distance rates since divestiture.

In addition, ITT Hartford has reduced its long-distance rates by switching traffic from one carrier to another when better rates were available. "In certain instances, some of the discounts offered by one vendor for a particular type of service were better than those we could get from another, so we shifted the traffic," Sidlauscus said.

Based on ITT Hartford's experience since 1979 with using multiple vendors to obtain the lowest costs on tariffed services, Sidlauscus offered some advice for other users looking to get the best rates.

He advised establishing guidelines covering such items as which sites will use a particular service and which carriers can issue proposals.

He also urged users to be aware of the specific costs associated with their current services in order to clearly understand what savings they can achieve. ◼

How to influence others without deceit

continued from page 27

managers control so many important resources — access to information through voice, data and video channels — that they can easily exchange these resources in return for assistance from other groups.

Network managers can and should apply many of these principles. For example, a network manager who needs the support and approval of the accounting department to purchase a private branch exchange should seek to build an alliance with the accounting manager. The network manager should invite the accounting manager early on to be part of the team examining the PBX purchase.

In addition, the net manager should point out some of the operational advantages a new PBX will bring to the accounting department as well as to the organization as a whole. By demonstrating respect for the accounting manager's expertise and acknowledging the need for his or her assistance, the net manager can go a long way toward building a healthy alliance that works to the advantage of both groups.

In contrast, network managers who try to outfox the accounting department by keeping them in the dark about how much a new PBX will cost will run into trouble. Sooner or later, accounting will be brought into the picture because it oversees the allocation of funds for the company.

This book offers a refreshing change from so many others that look at the sources of influence. A manager does not have to be Machiavellian to succeed. In fact, such an approach almost always leads to the person's ultimate downfall. Managers who engender the trust and respect of others will ultimately succeed. ◼

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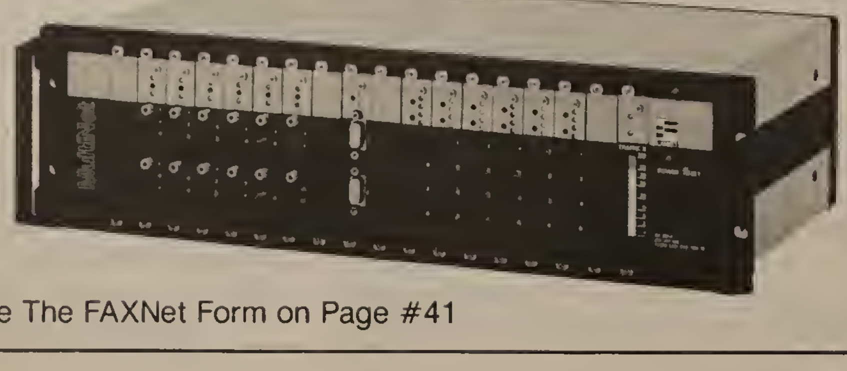

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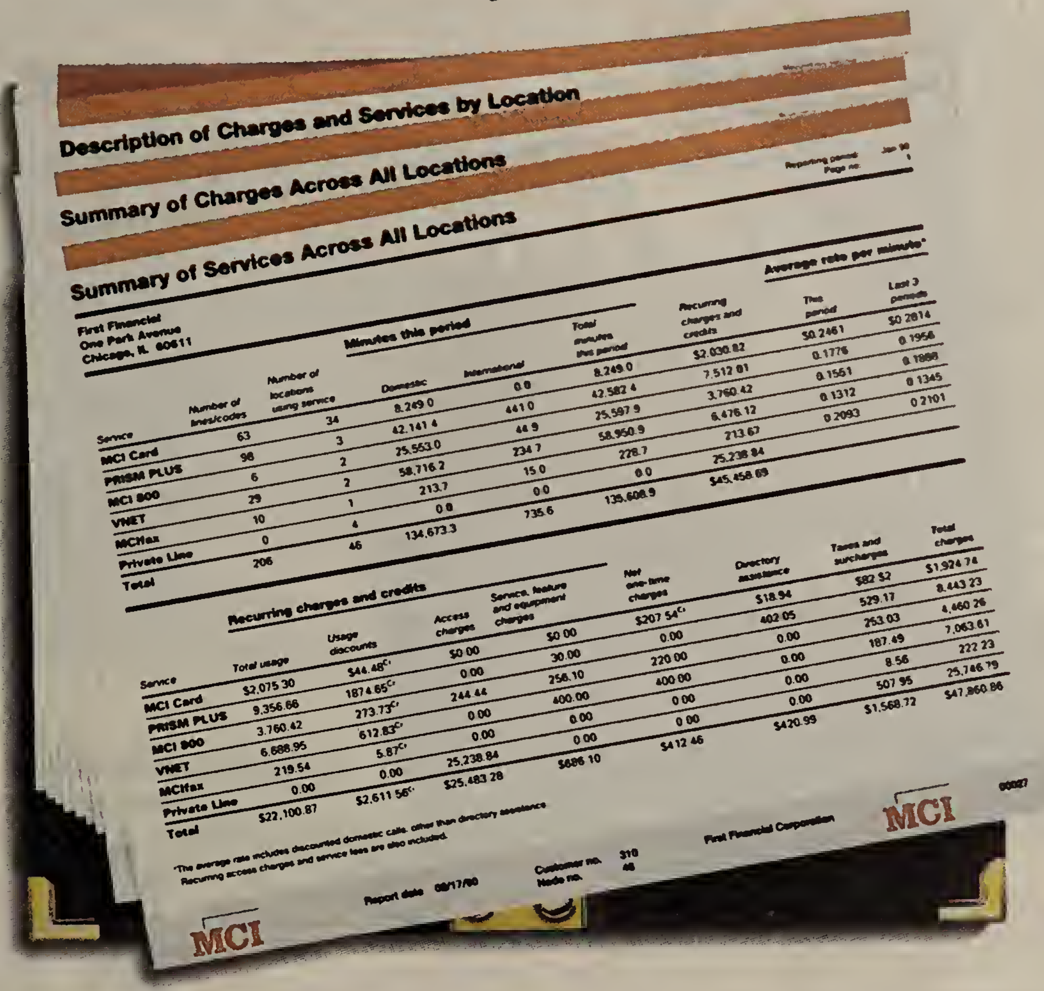

Description of Charges and Services by Location

Summary of Charges Across All Locations

Summary of Services Across All Locations

Reporting period: Jan 90
Page no: 1

First Financial
One Park Avenue
Chicago, IL 60611

Service	Number of lines/codes	Number of locations using service	Minutes this period Domestic	Minutes this period International	Total minutes this period	Recurring charges and credits	Average rate per minute* This period	Average rate per minute* Last 3 periods
MCI Card	63	34	8,249.0	0.0	8,249.0	$2,030.82	$0.2461	$0.2814
PRISM PLUS	98	3	42,141.4	441.0	42,582.4	7,512.01	0.1776	0.1956
MCI 800	6	2	25,553.0	44.9	25,597.9	3,760.42	0.1561	0.1888
VNET	29	2	58,716.2	234.7	58,950.9	6,476.12	0.1312	0.1345
MCIfax	10	1	213.7	15.0	228.7	213.67	0.2093	0.2101
Private Line	0	4	0.0	0.0	0.0	25,238.84		
Total	206	46	134,673.3	735.6	135,608.9	$45,458.69		

Service	Recurring charges and credits Total usage	Usage discounts	Access charges	Service, feature and equipment charges	Net one-time charges	Directory assistance	Taxes and surcharges	Total charges
MCI Card	$2,075.30	$44.48Cr	$0.00	$0.00	$207.54Cr	$18.94	$82.52	$1,924.74
PRISM PLUS	9,356.66	1874.65Cr	0.00	30.00	0.00	402.05	529.17	8,443.23
MCI 800	3,760.42	273.73Cr	244.44	256.10	220.00	0.00	253.03	4,460.26
VNET	6,688.95	612.83Cr	0.00	400.00	400.00	0.00	187.49	7,063.61
MCIfax	219.54	5.87Cr	0.00	0.00	0.00	0.00	8.56	222.23
Private Line	0.00	0.00	25,238.84	0.00	0.00	0.00	507.95	25,746.79
Total	$22,100.87	$2,611.56Cr	$25,483.28	$686.10	$412.46	$420.99	$1,568.72	$47,860.86

*The average rate includes discounted domestic calls, other than directory assistance. Recurring access charges and service fees are also included.

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Worth Noting

Tokyo-based Canon Co., Ltd. and the French travel agency Wagons-lits Tourisme recently became the first users of ISDN services between France and Japan. The companies access switched 64K bit/sec service via Basic Rate Interface connections to local public networks.

World News

Starting July 22, **AT&T** plans to begin letting users outside New York access its **International City Center Service (ICCS)** without subscribing to the carrier's Software-Defined Network (SDN) virtual network offering.

ICCS, often called Global SDN by AT&T, lets users access several SDN services internationally. Currently, ICCS is only available to SDN subscribers or to non-SDN subscribers with dedicated access to an AT&T point of presence in New York. Earlier this month, however, AT&T filed a tariff with the Federal Communications Commission that will make ICCS available to all users that have dedicated links to any AT&T point of presence that now supports SDN services. A dedicated link must also be maintained to points of presence used by a foreign carrier to support ICCS.

MCI Communications Corp. and Belgium's national carrier, **Regie des Telegraphs et Telephones**, last week announced plans to begin offering one-stop shopping services to users that buy international circuits from the two carriers.

The service will enable users purchasing a private line from the U.S. to Belgium to contact only one of the carriers to have the circuit installed. They will also only be billed by one carrier in the currency the user prefers.

European transatlantic private-line tariffs

Carrier	Monthly charge		
	Analog voice/ data circuit	56K or 64K bit/sec satellite circuit	T-1 satellite circuit
Belgium's Regie des Telegraphs et Telephones	$4,032	$5,180	$44,030
British Telecommunications PLC	$3,485	$4,250	$42,500
Deutsche Bundespost Telekom	$3,699	$5,286	$52,864
France Telecom*	$3,024	$4,284	$39,834
Mercury Communications, Ltd.	Not applicable	$3,698	$37,024
PTT Telecom Netherlands International	$4,373	$5,830	$46,640
The Swiss Post, Telegraph and Telecommunications Authority	$4,322	$6,300	$52,500

Charges only for the European half of transatlantic circuits. Separate charges are levied by the U.S. carrier that supplies service.

*Rates scheduled to take effect on July 1.

SOURCE: LYNX TECHNOLOGIES, INC., LITTLE FALLS, N.J., AND COMPANY REPORTS
GRAPHIC BY SUSAN J. CHAMPENY

Focus on price cuts shifts to service issue

Battle over telecom rates in U.K. has cooled; other European rates may level as service issues arise.

By Barton Crockett
Senior Editor

LONDON — The future of competition between Europe's national carriers for U.S. network business may be foreshadowed by the dwindling price war between the U.K.'s two service providers, British Telecommunications PLC and Mercury Communications, Ltd.

After a period of hot competition, the price war between the two U.K. carriers has cooled and several observers are predicting that the rates of the other Western European carriers will likewise stabilize.

"The same thing's happening over there that happened over here with AT&T and MCI," said Virgil Carden, director of communications and network services at the Princeton, N.J., operations center of Dow Jones & Co., Inc. "Everything gets real competitive until everyone has the same prices [and then] service-related things come into play."

Back to the future

The U.K. may be representative of things to come in the rest of Europe because the country led the charge into the competitive era. Before Mercury was founded in 1981 and given a license to compete with British Telecom in all net services in 1984, every carrier in Europe had a monopoly over domestic and international services in their respective countries.

The ensuing price competition between Mercury and British Telecom eventually spilled over to other European carriers, which have had to slash prices to avoid losing international business to the two U.K. service providers.

"We played a game of tag, where we'd cut prices and then [British Telecom] would to keep up," said George Hayes, Mercury's product manager for domestic and international private lines.

Over the past year, however, the galloping price competition between the U.K. carriers has slowed to a trot. Hayes said Mercury now offers to large-volume international customers private-line prices that average only 5% to 10% below British Telecom's prices.

> "The same thing's happening over there that happened over here with AT&T and MCI."

▲▲▲

The narrow differential has made issues such as net uptime, installation intervals and customer support the fundamental attributes users analyze when choosing between service providers.

"One could conclude, I suppose, that we've realized it's not a winning proposition" to continue cutting prices when the competing carrier is likely to respond with similar rate reductions, Hayes said. "We're really not

(continued on page 34)

Hong Kong users scurry to prep for rule under China

Some firms ready alternative hubs in other cities.

By Walter Sweet
West Coast Correspondent

HONG KONG — Telecommunications users here aren't packing up to leave just yet, but some are establishing network contingency plans in the event that Hong Kong's return to Chinese rule in 1997 brings harsh communications reforms.

Some users are already setting up redundant telecommunications hubs elsewhere in the Pacific, increasing their reliance on switched services and reincorporating Hong Kong-based companies in other countries to make it easy to bail out of the province should China alter the business landscape once it assumes control.

China has guaranteed businesses that Hong Kong will operate for 50 years beyond 1997 as it does today. But in the wake of last year's Tiananmen Square incident and the subsequent shutdown of the country under martial law, some business leaders say they think that Hong Kong may be a risky business location.

"Just about everyone is thinking about what to do by 1997 and beyond," said Simon Krieger, managing director of AT&T Hong Kong, Ltd. "The question is, will Hong Kong still be what it is today when it becomes a part of the People's Republic of China?"

Telecom mecca

According to the Hong Kong Economic & Trade Office, the U.K. province hosts more than 1,000 U.S. companies and is home to 400 international companies with telecommunications hubs. More than 2,000 international leased circuits connect into Hong Kong, making it the largest telecommunications mecca for international businesses in the Pacific Rim.

Although the transition is more than six years away, some

(continued on page 34)

SITA bolsters SNA support, adds first X.25 abilities

By Barton Crockett
Senior Editor

PARIS — Societe Internationale de Telecommunications Aeronautiques (SITA), the international value-added network provider for the airline industry, recently enhanced its support of Systems Network Architecture protocols and added support for X.25 traffic.

Officials with the nonprofit service provider, owned by dozens of airlines in a variety of countries, said SITA has enhanced its support of SNA traffic at all of its 226 primary network nodes around the world and is now supporting X.25 traffic at 70 of these nodes. SITA plans to support X.25 traffic at all of its nodes within the next few months.

Previously, SITA supported only data traffic from subscribers that utilized P1X24 and P1024 B and C, the airline-specific protocols established by the Geneva-based International Air Transport Association.

"We are supporting [SNA and X.25] because we are owned by the airlines, and the airlines want to move over to [these] architectures," said Guy Langevin, SITA assistant to the general manager for network services in North America and the Caribbean.

Langevin said X.25 and SNA services are being offered as a network alternative for subscribers that do not wish to utilize the P1X24 and P1024 protocols.

Langevin said the airline-specific standards that SITA supports predate X.25 and SNA. They were established by the industry in the 1960s and '70s to support airline computer reservation systems. He said airlines now want to adopt more widely accepted protocols, such as X.25 and SNA, because these standards will be easier to support, more reliable and less expensive.

According to Langevin, P1X24 is used to support communications between customer-owned host computers and SITA access nodes, while P1024 B and C support connections between customer terminals and the SITA network.

Langevin said hosts are typically connected to SITA nodes with leased lines at speeds ranging from 9.6K to 56K bit/sec, while terminals are linked to SITA nodes through users' cluster controllers via 9.6K bit/sec private lines.

Langevin said the SNA upgrade will enable SITA subscribers to improve their management

(continued on page 34)

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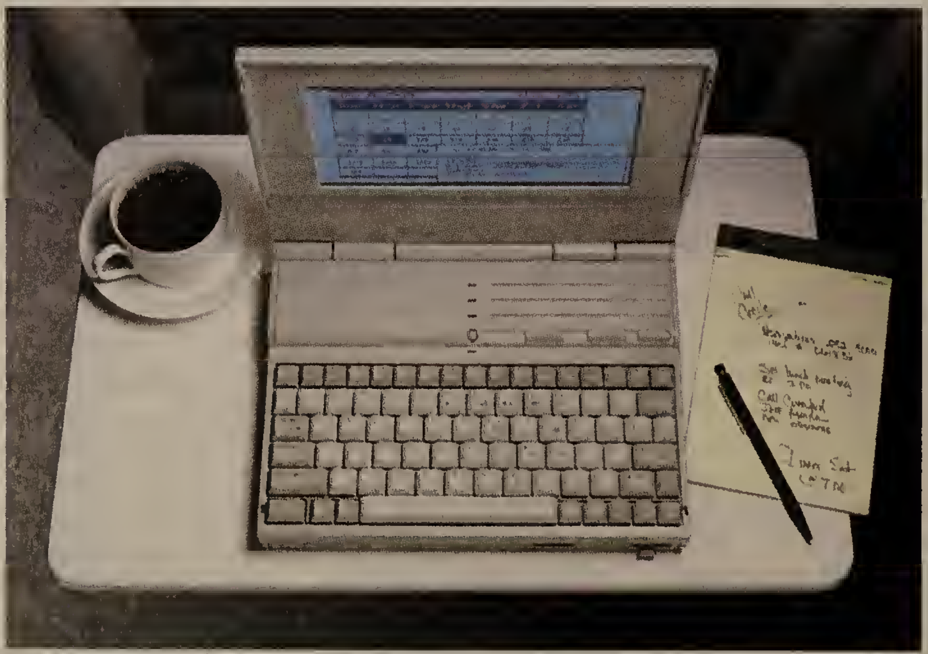

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Hong Kong preps for rule under China

continued from page 31

users are rethinking their plans now, while other Pacific Rim countries are making it attractive for companies to locate new businesses and telecommunications hubs in their cities.

Reuters Holding PLC of London, for instance, is expanding its communications center in Tokyo but said the expansion is not a sign that the company is leaving Hong Kong. "We're not pulling out of Hong Kong," a company spokesman said, explaining that the growth of the company's communications bases in Tokyo just reflects the growth in the number of customers in Japan. However, others point out that if Hong Kong should be affected by martial law or tighter regulatory constraints, Reuters would be able to shift network traffic to Japan with ease.

Reuters has 256K to 512K bit/sec satellite and fiber cable links throughout the Far East. The company is looking at T-1 capacity because of increasing growth in the area, the spokesman said.

According to Scott Brear, managing consultant with Price Waterhouse Management Consultants, several banks, entertainment and travel-industry companies have already set up alternate offices and network hubs in Japanese cities and Singapore to serve as a backup.

Although he declined to name the companies, Brear said they are making the move now to develop adequately trained personnel needed to operate and manage the network.

Possible brain drain

Some companies, he said, are gravely concerned about a possible "brain drain" of employees. According to Hong Kong's government figures, about twice the number of people are emigrating from Hong Kong than in past years. More than 40,000 people, mostly professional workers, left the country last year. Another 10,000 to 20,000 are expected to depart this year.

Currently, residents must undergo a lengthy emigration procedure if they wish to leave. This is forcing some residents to start the emigration process now, according to U.K. consulate officials.

To help slow the drain on professional talent, the U.K. government is considering granting 50,000 British passports to heads of households to keep people from leaving. This would assure professional workers they could work in Hong Kong with the option of leaving as a British citizen if conditions deteriorate.

Most companies are staying put and waiting to see what changes, if any, the transition brings, according to Peter Branson, general manager of marketing for Hong Kong Telecom International, which provides international telecommunications services.

"There's no sign that customers are packing up and going away," Branson said. "We're putting our money where our mouth is [in] that Hong Kong is going to continue to prosper." ◼

Focus on price cuts shifts to service

continued from page 31

competing so much on price anymore, as on availability and service-related issues."

Several users agreed.

"People usually split their business between the two carriers anyway," said a network manager with an on-line information services company, who requested anonymity. "The carrier that gets the larger share of that business is the one that gives you the best service and reliability, not the one that offers you a 5% discount."

Mercury currently offers the lowest international private-line prices of any European carrier (see graphic, page 31). The carrier supports close to half of the digital circuits running from the U.S. to the U.K., but does not compete in the market for international analog circuits, which British Telecom now monopolizes.

Several observers said that the dwindling price competition between the two U.K. carriers will be mirrored throughout Europe.

"As you get closer to cost, everyone's just got less room to lower prices. I believe that service is going to be the key issue of the 1990s," said Joseph McQuaid, vice-president of marketing for New York-based France Telecom, Inc., the U.S. subsidiary of the French carrier. ◼

SITA bolsters SNA support, adds X.25

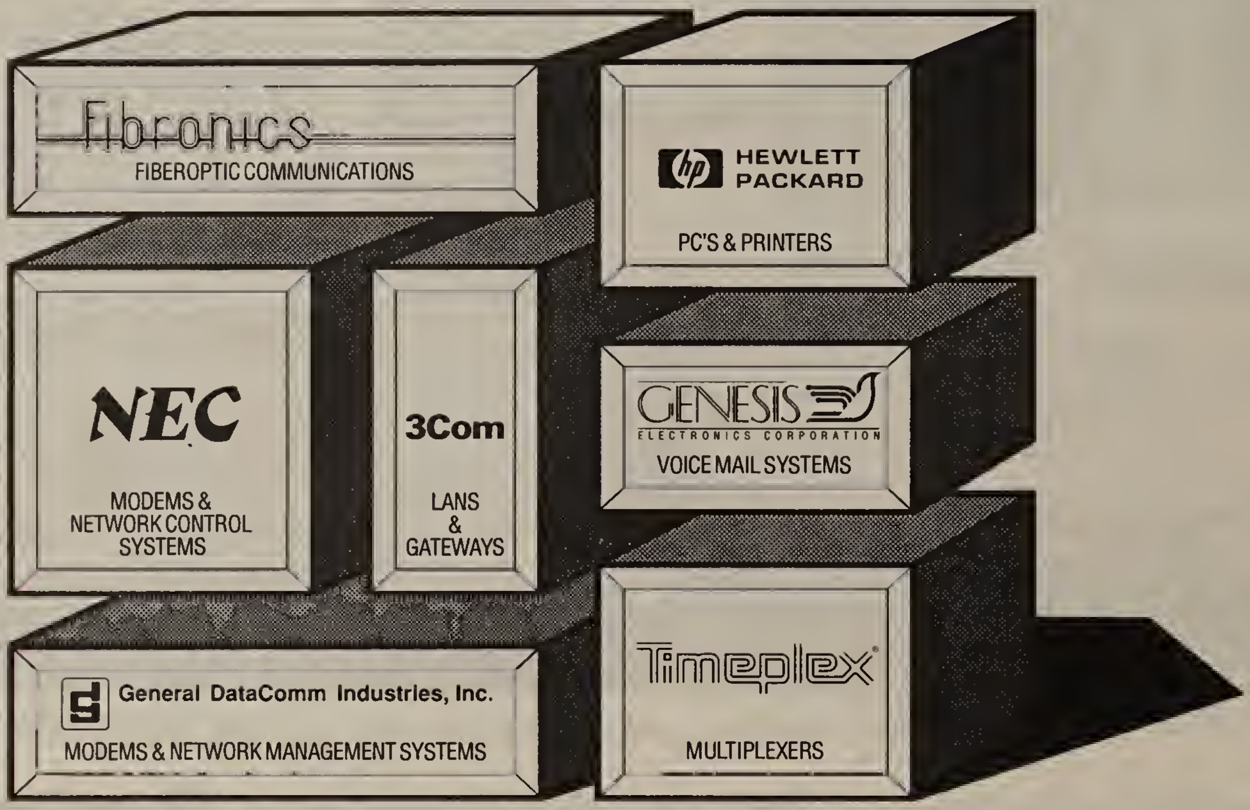
continued from page 31

of SNA traffic sent over the SITA net. Previously, Langevin said, SITA supported SNA traffic from subscribers by having SITA network nodes emulate a cluster controller when communicating with a user's host and having the nodes emulate an IBM mainframe when communicating with the user's dumb terminals.

Use of these emulation techniques limited the amount of network control information that user-operated NetView network management systems could gather about dumb terminals attached to the SITA network, he said. The addition of new SNA software to SITA nodes will eliminate the need for controller and host emulation.

The upgrade will enable the NetView systems to gather as much data about dumb terminals attached to the SITA network as they gather about dumb terminals attached directly to the user's private network, Langevin said.

To support X.25 traffic, SITA is installing X.25 packet switches at all of its major access nodes, he said. ◼



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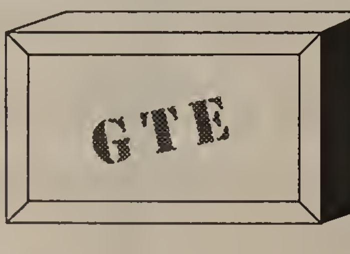

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First Look

Cisco SNMP software runs on SPARCstations

Cisco Systems, Inc. recently announced that **NetCentral Station,** its Simple Network Management Protocol (SNMP) software, now runs on Sun Microsystems, Inc. SPARCstations.

The software, introduced in February 1990, previously ran on Sun-3s running X Window System server software. NetCentral Station provides network managers with a visual map of the network that provides for real-time monitoring ("Cisco unveils management software for SNMP nets," *NW*, Feb. 19).

The company said the software has been ported to the SPARCstation because it provides greater computing power than the Sun-3, a key consideration for users with large, complex wide-area nets. The Sun-3 performs four million instructions per second (MIPS), whereas the SPARCstation performs between 12 and 20 MIPS, depending on the model.

The software manages all cisco Systems devices, including bridges, routers and terminal servers. It also incorporates a Sybase, Inc. SQL Server relational data base, which collects network statistics for off-line analysis.

NetCentral Station, an SNMP station management offering, works with any SNMP agent device, the vendor said.

NetCentral Station for the SPARCstation is available now for $14,000, the same price as the NetCentral Station for the Sun-3 workstation.

The SPARCstation requires 12M bytes of random-access memory and 208M bytes of hard disk memory.

cisco Systems, Inc., 1350 Willow Road, Menlo Park, Calif. 94025; (415) 326-1941.

Card links SPARCstations and AppleTalk LANs

Information Presentation Technologies, Inc. recently introduced an interface card that allows Sun Microsystems, Inc. SPARCstations based on the S-bus to connect to an Apple Computer, Inc. AppleTalk local-area network.

The **S-Bus 230/A Local-**

(continued on page 41)

Rockwell ACD software improves caller services

Gives callers estimated holding time, options.

By Tom Smith
New Products Editor

DOWNERS GROVE, Ill. — Rockwell International Corp.'s Switching Systems Division recently announced software enhancements for its Galaxy Automatic Call Distributor (ACD) that are designed to improve call services and reduce abandoned calls.

Rockwell's new IQueue software consists of Intelligent Announcements, which are recorded messages that inform callers how long they must wait for an agent to field the call; Intelligent Routing, which enables callers to transfer to different departments; and ACD Mail, which lets callers leave short voice messages requesting a return call.

ACDs distribute incoming calls, typically received over 800 lines, to available agents.

The new IQueue software resides on both the ACD and Call Response, a stand-alone call processor that sits between the ACD and internal phones.

Waiting in line

With Intelligent Announcement, callers waiting for an operator can be informed of how long the holding time is expected to be or they can be told how many calls are ahead of them. The software counts the calls in queue and performs an analysis of call statistics such as the average call duration and number of agents available.

Prior to this capability, callers were greeted with a "delay announcement," which told them only that their call would be handled in the order of its arrival.

Intelligent Announcement is intended to reduce abandoned calls.

The second IQueue program, Intelligent Routing, enables callers to transfer their call by selecting options from a push-button phone. This will allow a customer, for example, to retrieve information from a data base or hear a recorded service announcement.

In the past, callers to companies with Call Response immediately received a menu of options that could be selected from their push-button phone. Now, with Intelligent Routing, they can hold for assistance or select one of several routing options.

This function is designed to reduce the number of misdirected

(continued on page 38)

NetWare servers optimized for disk-duplexing feature

SCOTTS VALLEY, Calif. — Rose Hill Systems, Inc. recently introduced two file servers for Novell, Inc. NetWare local-area networks that provide fault tolerance by simultaneously writing data to two hard disks.

Rose Hill's Fault Tolerant System-30 (FTS-30) and FTS-80 support a process called disk duplexing, in which two disk controllers are used to concurrently write files to separate disks.

This provides users with better fault tolerance than disk-mirroring features offered by other vendors, the company claimed.

Rose Hill's FTS-30 and FTS-80 are based on 33-MHz Intel Corp. 80386 microprocessors; both support NetWare 386 and NetWare 286.

The FTS-80 has more than double the hard disk storage of the FTS-30.

Rose Hill's new servers are the only 80386-based industry-standard architecture (ISA) computers optimized for use with NetWare's disk-duplexing capability, according to Jerry Kelly, company president.

The company uses two proprietary Enhanced Systems Drive Interface (ESDI) controllers to perform the disk duplexing.

Disk duplexing

Disk duplexing protects mission-critical data stored on the file server, making it ideal for users that require fault tolerance and data security, according to Kelly.

By contrast, fault-tolerant servers that support disk mirroring may protect data from hard disk failures, he added, but they run the risk of controller failures because they use a single controller to write files to separate disks.

Disk duplexing, by contrast, protects data from both hard disk and drive controller failures because it has two separate controllers, thus improving the level of fault tolerance.

In a base configuration, both servers have 1M byte of main

(continued on page 41)

Harris Adacom products at a glance

Product	Remote hosts supported	Devices supported	Expansion slots	Price
Strategy 9574 terminal controller	4 remote hosts or 1 host with four sessions	Up to 64 3270 devices	5	$12,600
Strategy 9577 print server	4 remote hosts	4 high-speed or 16 low-speed printers	6	$9,995
Strategy 9570 SNA gateway	1 to 4 hosts with up to 254 sessions	PCs, Macintoshes and any workstation that supports TCP/IP	6	$11,200

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: HARRIS ADACOM CORP., DALLAS

SNA gateway, 3270 controller unveiled

Harris Adacom rounds out SuperNet family with low-end models; introduces its first print server.

By Tom Smith
New Products Editor

DALLAS — Harris Adacom Corp. recently expanded its SuperNet communications line with two low-end products: an IBM-compatible terminal controller and a Systems Network Architecture gateway.

The products, comprising the Strategy line of the SuperNet family, also include the firm's first server for remote and local-area network printing applications. The offerings are less powerful, less expensive alternatives to the firm's high-end Super Controller and Super Gateway models.

All three Strategy products are based on the Intel Corp. 80386 microprocessor, and they all support the industry-standard architecture (ISA) bus and run under the Unix operating system.

The new terminal controller, the Strategy 9574, can support 64 coaxial connections to IBM 3270 terminals.

The firm's older Super Controller supports only 32 devices, the same number supported by IBM terminal controllers; however, the Super Controller will be upgraded to support 64 devices. In addition, it supports a greater range of Unix applications than the new low-end model.

The Strategy 9574 supports connections to as many as four remote hosts over a multidrop line, as well as four communications sessions with a single host over four lines operating at speeds up to 64K bit/sec. It can also communicate with four nodes on a token-ring LAN via a token-ring interface on the Strategy 9574.

The earlier generation Super Controller also supported four host connections, while the IBM 3X74 supports a maximum of two host connections, according to Charles Biggs, director of marketing at Harris Adacom.

The Strategy 9574 recognizes LAN nodes as IBM LU 2 sessions, such as those generated by 3270-type terminals. By contrast, IBM controllers view those nodes as IBM PU 2 devices. Logical units generate less network overhead and require less host memory than physical units because they do not require polling addresses.

Harris Adacom's 9574 terminal controller extends host access to devices such as personal computers, Apple Computer, Inc. Macintoshes, Sun Microsystems, Inc. workstations, as well as workstations on Ethernet and 4M bit/sec token-ring LANs. The Super Controller supports these devices as well. With the exception of Ethernet connections, the IBM 3X74 also supports these devices.

> All three products are based on the Intel Corp. 80386 microprocessor and support the ISA bus.

▲▲▲

When connecting a Sun workstation to an IBM host, the Strategy 9574 can function as a remote gateway converting between Transmission Control Protocol/Internet Protocol and SNA/3270 formats. Protocols supported by the unit, in addition to SNA and TCP/IP, include Novell, Inc.'s NetWare Integrated

(continued on page 38)

Your troubl

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Mux supports data from 8 IBM terminal controllers

By Tom Smith
New Products Editor

ROCHELLE PARK, N.J. — Lannet Data Communications, Inc. recently introduced a multiplexer that enables data from up to eight IBM terminal controllers to be transmitted over a single line.

Lannet claimed its new LM-256 is the first product that allows traffic from several terminal controllers to be multiplexed onto a single line. Previously, multiplexers from Lannet and other vendors allowed traffic from multiple ports on a single IBM 3X74 controller to be aggregated over a single line.

By supporting as many as eight 3X74 controllers, the new LM-256 is capable of multiplexing traffic from up to 256 IBM 3270 terminals over a single fiber-optic line. That line, which supports a speed of 42M bit/sec, can extend the distance between multiplexers to 10,000 feet. The multiplexers must be linked in a point-to-point configuration.

Terminals or 3X74 controllers can be located up to 850 feet from the LM-256.

> Terminals or 3X74 controllers can be located up to 850 feet from the LM-256.
>
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The unique capability of the LM-256 makes it the backbone of Lannet's LM product line, which previously consisted only of multiplexers that allowed data from four, eight and 32 3X74 ports to be multiplexed over a single line. The LM family also consists of terminal multiplexers that work in tandem with the controller multiplexers and allow multiplexed data coming in from a single line to be demultiplexed and sent to multiple terminals.

The LM-256 works with all existing members of the LM product family, which can be used to feed data into the new multiplexer.

Lannet says a pair of the LM-256 units should be used in a point-to-point topology. The eight ports on the multiplexer at one end can connect controllers, while the corresponding ports at the other end can serve as the terminal link. In case of failure on the main link, automatic switchover to a redundant link ensures connectivity.

The LM-256 is available now for $2,500. It can be installed in a standard 19-in. rack enclosure.

Lannet Data Communications, a subsidiary of The RAD Group, Inc., can be reached by writing to 151 W. Passaic St., Rochelle Park, N.J. 07662, or by calling (201) 587-8822. ◘

SNA gateway unveiled

continued from page 35

Packet Exchange (IPX) and IBM's Network Basic I/O System Extended User Interface for Token-Ring LANs.

Like the Super Controller, the Strategy 9574 can support IBM 3270 devices on an Ethernet network.

IBM supports Token-Ring connectivity with its 3X74, but since Ethernet has a larger installed base, there is demand for running Ethernet and 3270 traffic over the same connection, eliminating the separate lines required by users of IBM terminal controllers, Biggs explained.

Another distinction between the Super Controller and the Strategy 9574 is that the Super Controller can support personal computers running off-the-shelf Unix applications, while the new controller supports a limited set of Unix applications developed by Harris Adacom.

Harris Adacom's Strategy 9574 is expected to be available next month. Pricing begins at $12,600 for a version with an SNA/Synchronous Data Link Control interface. The Super Controller pricing starts at $20,500. That machine has seven ISA expansion slots, whereas the 9574 has only five.

Print server strategy

The new print server, the Strategy 9577, provides communications with as many as four hosts over 64K bit/sec SDLC lines or across a token-ring or Ethernet LAN. The Strategy 9577 can support four high-speed or 16 low-speed printers.

Pricing for the Strategy 9577, which has six expansion slots, begins at $9,995. That cost includes a single SDLC connection.

Low-end gateway

Finally, Harris Adacom unveiled a low-end SNA gateway, the Strategy 9570, which allows up to four SNA hosts to communicate with personal computers, Macintoshes and any workstation supporting TCP/IP.

The 9570 can emulate as many as four IBM PU 2 devices, which are recognized by the IBM host as cluster controllers. Consequently, it can support up to 254 host sessions, Biggs said.

Unlike its predecessor, the Super Gateway, the Strategy 9570 is designed to perform one function at a time.

Its predecessor, by contrast, was designed to support multiple protocol conversions simultaneously and several functions at one time. Super Gateway, for example, could function as a print spooler, establish file-sharing sessions or process Unix applications on the part of the computer not dedicated as a gateway.

Strategy 9570 will also be available next month. It is priced at $11,200 with six expansion slots and a single Ethernet or token-ring connection — about $10,000 less than the Super Gateway, which comes with eight expansion slots.

Harris Adacom can be reached by writing to 16001 Dallas Pkwy., P.O. Box 809022, Dallas, Texas 75380, or by calling (214) 386-2000. ◘

ACD software improves services

continued from page 35

calls, lower abandoned call rates and give the caller greater control over the call completion process.

Finally, IQueue offers ACD Mail, which allows callers, after hearing an Intelligent Announcement, to leave a voice mail message requesting a call back, rather than waiting for a representative to answer the call.

In the past, users could leave a voice message, but they did so without knowing how long they would have had to wait for service.

ACD Mail assures that calls of a critical nature are answered as promptly as possible, while less critical inquiries can be answered when time permits.

Delivery of IQueue is 90 days after receipt of order.

For Galaxy users that need to purchase the Call Response unit, the cost for hardware and software is $98,000. For Galaxy users that already have Call Response installed, the cost is $49,000 for all three software features.

A follow-up release of IQueue will offer even greater functionality, although Rockwell could not specify when it will be available.

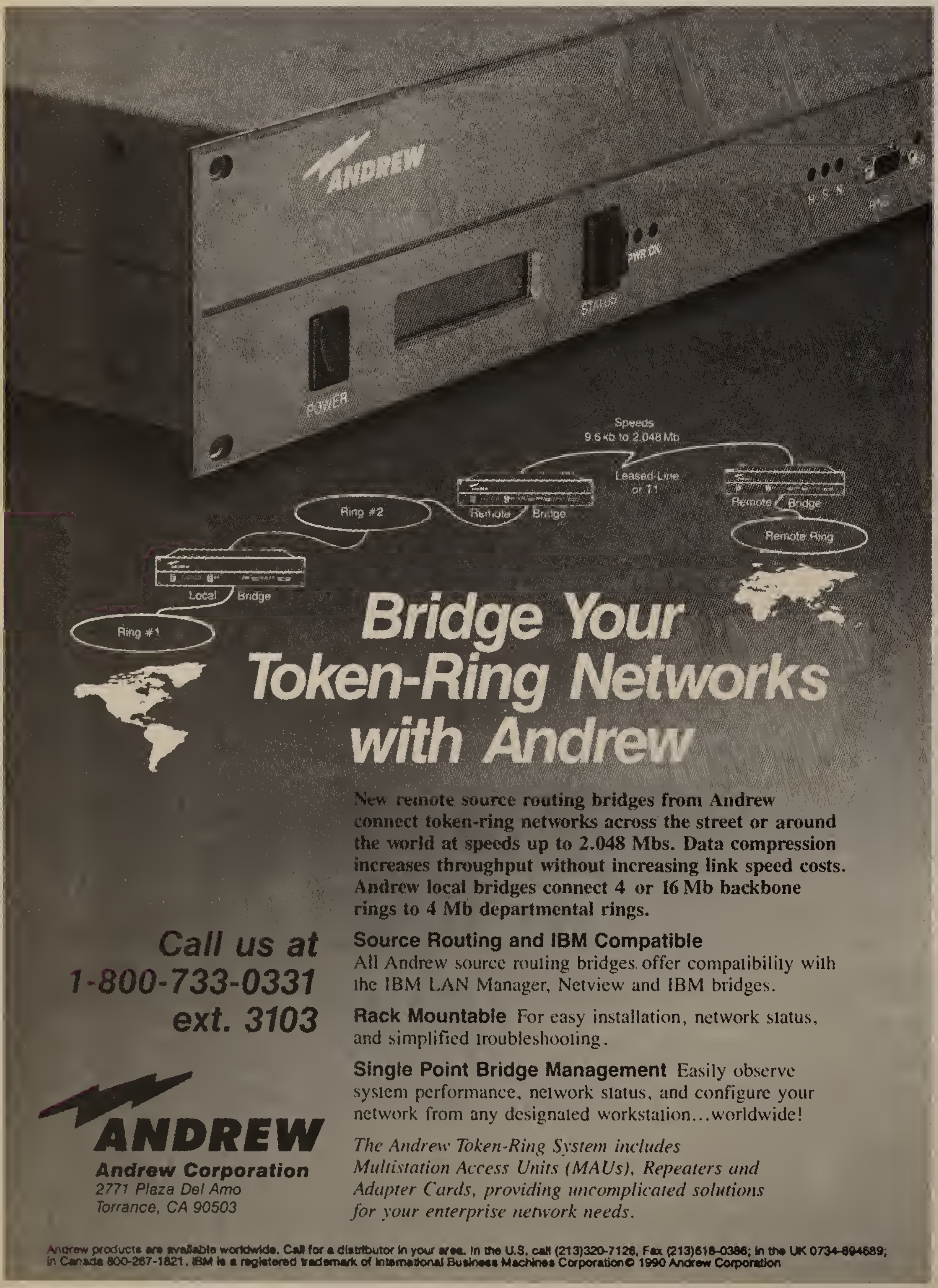
Among the enhanced functions, ACD Mail with Automessage Delivery will put voice messages in queue for automatic delivery to representatives, just as live calls are handled, eliminating the need to manually retrieve messages.

ISDN feature

The other capabilities to be offered in the future on IQueue — ACD Mail with Agent Controlled Autodial and ACD Mail with System Controlled Autodial — will use Integrated Services Digital Network's automatic number identification feature to speed the process of returning calls.

With these software packages, an agent can dial an outside number with a single keystroke or the system can dial the number automatically.

For more information, contract Rockwell's Switching Systems Division at 1431 Opus Place, Downers Grove, Ill. 60515, or call (312) 960-8000. ◘



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First Look

continued from page 35

Talk Interface Card allows connection of Sun's SPARCstation and SPARCstation Plus to Macintosh and DOS-based personal computers residing on an AppleTalk LAN. In this configuration, the Sun workstations function as Unix hosts in the uShare environment. The uShare offering, a set of software programs, allows a Unix host to function as an AppleShare server.

The S-Bus 230/A LocalTalk Interface Card is expected to be available in July for $595.

Information Presentation Technologies, Inc., 5000 N. Pkwy. Calabasas, Suite 304, P.O. Box 8609, Calabasas, Calif. 91302; (818) 347-7791.

DEC bundles OSF/Motif tool kit with VMS and Ultrix in software pack

Digital Equipment Corp. recently said it is now shipping with its VMS and Ultrix operating systems a developer's tool kit for the Open Software Foundation/Motif (OSF/Motif) graphical user interface.

The DECwindows Developer Kit for OSF/Motif is a software package for developing new Motif applications or converting to OSF/Motif standard applications based on the X Window System or X User Interface, which is used in DEC's DECwindows software.

OSF/Motif, developed by OSF, is the standard graphical user interface that supports the X Window System. The OSF/Motif application programming interface includes the user interface language and tool kit, which are based on the X User Interface.

The company also announced that it will include a license for OSF/Motif with all of its new VAX and Reduced Instruction Set Computer workstation orders. In addition, all currently installed Ultrix workstations will automatically be licensed to use OSF/Motif.

Pricing for the media and documentation is $385 per tool kit for either VMS or Ultrix. The license fee for Ultrix workstations is included in the cost of the Ultrix Worksystem Software license. The price of a license for VMS workstations is $50.

Digital Equipment Corp., Maynard, Mass. 01754; (800) 332-4786.

Aldus' PageMaker publishing software supports Microsoft Mail

Aldus Corp. recently announced that the latest release of its PageMaker desktop publishing software for the Apple Computer, Inc. Macintosh environment now supports Microsoft Corp.'s Microsoft Mail.

PageMaker for the Macintosh 4.0 users will be able to share documents across an AppleTalk network while continuing to work in their primary application. For example, by selecting commands such as "Place Mail" from the PageMaker menu, users can insert a document sent via Microsoft Mail directly into an open PageMaker file.

Microsoft Mail users will no longer need to save a PageMaker document as a separate attachment in order to send it to another user on the network. With Version 4.0, users can send PageMaker documents via Microsoft Mail directly from the menu without having to quit or open a new window.

PageMaker for the Macintosh 4.0 is shipping now. It costs $795, and site licenses are available.

Aldus Corp., 411 First Ave. S., Seattle, Wash. 98104; (206) 628-2320. ◘

NetWare servers optimized

continued from page 35

memory, expandable to 16M bytes. Both FTS models execute 7.55 million instructions per second. Each model comes with six ISA expansion slots, as well as one parallel and two serial ports.

Storage space

The FTS-30 comes with two 320M-byte hard disks, and the FTS-80 supports two 680M-byte hard disks. The two ESDI controllers on each file server can be configured to support two hard disks each for a total of four per system. This means the FTS-30 can support as much as 1.2G bytes of hard disk storage, while the FTS-80 can support 2.72G bytes of storage.

Both servers include two ESDI cache controllers with 32K bytes of cache memory to further improve performance. The ESDI cache memory allows frequently used file server routines to be stored in random-access memory on the controller, which minimizes disk drive accesses and disk head search activity, Kelly explained.

Expanded cache controller

For applications that require higher cache memory on the ESDI drive controller, Rose Hill also offers an expanded cache controller with between 0.5M and 16M bytes of on-board memory. Pricing for these controllers starts at $795.

The number of users that each server can support depends on the NetWare version in use. NetWare 386, for example, can support 250 users in its most current release, Version 3.0. However, Release 3.1, which is expected to ship this month, will allow it to support 1,000 users, Kelly said.

NetWare 286, by contrast, supports up to 100 users.

FTS-30 and FTS-80 are available now for $7,995 and $9,995, respectively.

For more information, contact Rose Hill at 4865 Scotts Valley Drive, Scotts Valley, Calif. 95066, or call (408) 438-3871. ◘

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OPINIONS

USER STRATEGIES

BY JAMES KOBIELUS

Today's users need time-crunching technologies

By innovatively using information technology, rapid response systems can compress into minutes organizational processes that used to take days or weeks. In seemingly no time at all, companies can spot trends, weigh alternatives, mobilize teams, produce designs and bring goods to market.

Strange as it may seem, we've begun to take the time-crunching powers of information technology for granted. The trade papers are full of success stories about firms that use technology to take a bite out of time. Applications that used to be the exception — such as just-in-time manufacturing, quick purchase order turnaround, accelerated product development cycle and concurrent engineering — have become the rule.

Advancing technology provides firms with a larger bag of tricks for squeezing more work into less time. The time-crunching technologies users rely on fall into four categories.

Rapid response is a necessity just to survive in this world of fast changing markets.

▲▲▲

■ **Capture technologies.** The sooner information can be captured into electronic form, the sooner it can be processed and moved across the network. Purchase orders are captured on salespeople's laptop computers and transmitted via modem to the nearest warehouse, ensuring next-day delivery for impatient customers. Same-day sales data is sent from retail point-of-sale systems to corporate planners, helping them set tomorrow's factory production levels. Product drawings are scanned into a computer-aided design system, enabling remotely located engineers to evaluate design changes without delay.

■ **Modeling technologies.** Work takes time if it's performed in a time-consuming, relatively inflexible medium, such as pen and paper or brick and mortar. A promising concept can be refined more quickly in an electronic medium — such as a word processing, spreadsheet or CAD system — in which alternative drafts, scenarios and models can be created, elaborated and discarded in short order.

■ **Rendezvous technologies.** Many business processes can be compressed by providing a convenient electronic rendezvous medium — messaging, conferencing or some hybrid of the two — for dispersed individuals. The rendezvous can be as simple as an electronic mail message or as elaborate as a full-motion videoconference. The important point is that needless delays are eliminated.

■ **Coordination technologies.** When organizations have tight deadlines to meet, there must be some means for ensuring that all involved parties are pulling together. Coordination can be automated via electronic data interchange through interlinked data bases, such as when one company's purchase order data base updates its supplier's order-entry data base, which in turn updates internal customer information, accounts receivable and production scheduling data bases. A business team can stay on track by means of a shared project management, action item reporting and group calendaring system. At the heart of these and other coordination technologies is some means for setting deadlines or due dates and exposing reasons for failures to meet them.

The hurried pace of today's business environment has forced companies to explore the potential of time-crunching technologies. Rapid response is a necessity just to survive in this world of fast changing markets, shortened product life cycles and cutthroat competition. ☒

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EDITORIAL

It's back to square one with Computer III Inquiry

If Yogi Berra had been in telecommunications rather than baseball, his famous line "It ain't over till it's over" probably would have been "It ain't ever over."

Since divestiture, the U.S. regulatory system has been in almost constant flux. For every new opportunity driven by divestiture, users and vendors must endure an equal number of regulatory delays.

A case in point is the Federal Communications Commission's Third Computer Inquiry, which took five years to wend its way through both the FCC and the court. Despite the time and money spent, users and carriers are still without a clear understanding of how regulators intend to manage enhanced services.

Until June 6, when a federal court of appeals overturned the FCC's Computer III decision, the industry was moving toward a future in which the regional Bell holding companies would be allowed to offer enhanced services through their telephone units and federal regulators would oversee enhanced services, even at the state level ("Court strikes down Computer III edict," *NW*, June 11). However, the appeals court's ruling calls into question whether the RBHCs can proceed.

What's worse, the ruling may not be the final word. The legal machinery would lurch into action all over again if the FCC or RBHCs appeal the case to the U.S. Supreme Court. Such an appeal would likely take a couple of years.

If the FCC won the appeal, the industry would revert back to the FCC decision issued in 1986. Some opponents say that could hurt users by making it easier for the RBHCs to cross-subsidize new ventures from regulated operations.

If the FCC lost its appeal, state regulators would have control over enhanced services, which could lead to 51 different sets of regulations — one for each of the 50 states and the District of Columbia.

If the FCC doesn't appeal, it will almost certainly have to open a new public proceeding to gather facts that the court said it failed to gather the first time around. This process wouldn't be a short-term fix either; it could easily take a year or more.

Many industry observers complain that all of this uncertainty could have been avoided if the FCC had done its job properly in the first place. They say that the commission's actions should have been driven more by a careful analysis of fact rather than ideology.

The FCC should skip a long drawn-out legal appeal and immediately start a new public proceeding. If Computer III is a good idea, then the facts will prove it. ☒

OPINIONS

TELECOMMUNICATIONS POLICY

BY ROBERT STEARNS

The FCC should revisit the collocation issue

While regulators, legislators and policymakers buzz over various telecommunications initiatives, one pressing issue lingers unresolved — collocation. Before this issue is lost altogether, the Federal Communications Commission should reconsider its position on collocation and adopt a nondiscriminatory collocation policy in tandem with its acceptance of "virtual collocation."

During the Reagan administration, the FCC's attitude toward collocation ranged from favoritism to pseudo-regulation. Specifically, it condoned discriminatory collocation by carriers and it accepted virtual collocation as a way of meeting comparably efficient interconnection (CEI) requirements.

In my opinion, collocation is a feasible policy that could benefit users by lowering costs and creating a competitive playing field between carriers and enhanced service providers. However, what form should it take?

There are essentially three possible collocation policies — mandatory physical, discriminatory and nondiscriminatory. And there is one substitute — virtual collocation.

- **Mandatory physical collocation** requires carriers to offer floor space inside a wire center to *all* users that want it. The FCC says it believes this arrangement would impose an unfair burden on carriers and ratepayers; the policy could require carriers to buy or rent new facilities to handle overflow when a wire center runs out of space, which could be prohibitively expensive.
- **Discriminatory collocation** allows carriers to choose which network integrators and enhanced service providers they will allow to collocate, if any. Essentially, success and failure in systems integration and enhanced services would be based on the carriers' choice of who may collocate, not on an individual company's business acumen.
- **Nondiscriminatory collocation** requires carriers to let noncarriers collocate on a first-come, first-served basis. Carriers would not have the right to unilaterally decide who can collocate. The terms and conditions of collocation would be defined by tariff.
- **Virtual collocation** does not involve physical collocation at all. It requires carriers to provide noncarriers with technical configurations that would minimize transport costs. It also requires a carrier-affiliated collocated enterprise to take the same tariffed rates as those charged to noncarriers located within a fixed radius from the wire center. Technical and economic inefficiencies make this a potentially contentious policy.

> Permitting AT&T to make a unilateral decision regarding who can collocate — to its benefit and to the harm of others — is unfair.
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Nondiscriminatory and virtual collocation provide the most equitable approaches to the issue. While these policies are not panaceas for creating a level playing field, they alleviate the problems associated with mandatory and discriminatory collocation to some degree.

Users find collocation desirable. For example, Shearson Lehman Hutton relies extensively on collocation to operate its Worldwide Intelligent Network. In the words of Andrew Sokolov, senior vice-president of Shearson's communications systems, "[physical] collocation gives you the flexibility to expand your net without hiring extra staff and access to things like [uninterruptible power supplies] at no extra cost."

Currently, AT&T can collocate its enhanced services on a waiver-specific basis under the CEI rules. This means that if the carrier wants to collocate these services, it must provide CEI to its competitors. However, AT&T can offer collocation of its other network services on a discriminatory basis without providing CEI. Tariff 12 and Custom Network Offering II are examples of this.

The fact that AT&T can discriminatorily provide collocation is significant. AT&T's dominant position in the ownership of points of presence makes it the carrier of choice among users seeking collocation. Permitting AT&T to make a unilateral decision regarding who can and cannot collocate — to its benefit and to the harm of other service providers — is patently unfair.

For example, it is plain to see the FCC's favoritism by its reasoning in the ONA Order, which can be fairly described as schizophrenic: It extols the virtures of a level playing field for enhanced service providers while conferring a competitive advantage on the carriers by allowing them to offer collocation on a discriminatory basis.

The FCC suggests that its CEI parameters ensure comparable technical performance, yet this is only theoretical. In any case, these guidelines do not provide for equal technical performance or equal costs.

While the FCC has ruled that it would accept what is now called virtual collocation, it has yet to go one step further to embrace a policy of nondiscriminatory collocation for systems integrators and enhanced service providers.

The FCC takes the position that nondiscriminatory collocation would pose some as yet unspecified problems. In short, the FCC's Phase 1 Order states, "Although carriers could develop a number of methods to allocate available space, including auc-

(continued on page 48)

Stearns is vice-president of corporate marketing at Codex Corp. in Mansfield, Mass.

TELETOONS

BY FRANK AND TROISE

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IT'S A LOGIC BOMB, ALL RIGHT! STAND BACK!!
TIC TIC TIC
PHIL FRANK

LETTERS

Magnetic media advantage

I would like to add some information to that contained in your article "Call detail options help users monitor net traffic" (*NW*, May 14). New paper-based forms of carrier billing have a serious disadvantage compared with magnetic media-based billing. Paper billing is geared to summaries and standard reports. Magnetic media billing is better for distribution of call detail records, which enable the customer to define exactly what analysis is needed.

Magnetic media ensures that customers get exactly what they want, when they want it. Also, the carrier saves reams of paper and avoids customization of reports on a customer-by-customer basis.

The alternative to magnetic media is electronic data interchange, which MCI Communications Corp. is currently exploring. My problem with EDI involves the multitude of formats available, as well as the computer communications time required to download many megabytes of data at 9.6K bit/sec or higher.

My company wants to pursue the magnetic media option most suited to our needs. We agree that distributing call detail information on diskette is a cumbersome method when there are hundreds of thousands of call records.

The alternatives to diskette distribution can be implemented reasonably and with assurance of standards. Streaming tape is well penetrated in the personal computer market in three common standards, one of which is usually present on every local-area network for backup purposes.

Optical disks are also standardized, even with the drivers included in the standard distribution of MS-DOS and PC-DOS. Removable hard drives, while not standardized, support capacities of at least 45M bytes. Optical disks and removable hard drives also

(continued on page 48)

Network World *welcomes letters from its readers.*

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"LET'S GET BUSY!" says talk show host Arsenio Hall to his audience. That's good advice for those who have an issue to discuss and would like to write a column for *Network World.*

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If you'd like to write a column, call Steve Moore, features editor, at (508) 820-7439 or fax your idea to us at (508) 820-3467.

All tied up?

The future of plastic fiber in the LAN market depends on user acceptance.

By LLOYD RESNICK

Today, the benefits of plastic are being proclaimed with optimistic urgency by suppliers of polymeric optical fiber (POF) and component vendors that are developing sources and receivers for POF-based data links. Some potential local-area network users are listening because of plastic fiber's significant cost benefits.

However, skeptics abound because POF may force LAN designers and users into untenable cost/performance trade-offs.

Del Hanson, engineering section manager for networks and standards development at Hewlett-Packard Co.'s Optical Communication Division, sums up the looming POF controversy when he says, "The subject of transmission over plastic fiber brings out extreme views as to what is feasible and what is not."

What POF offers

Plastic fiber seems feasible as a cost-effective extension of fiber optics to the desktop. A recent study conducted by AT&T found that more than 95% of all desktop workstations are located within 250 feet of a wiring closet. Such a distance equals the maximum span for today's POF link; longer distances result in excessive attenuation.

POF offers the same advantages over twisted-pair and coaxial cable that glass optical fiber offers: small size, light weight, immunity to electromagnetic and radio frequency interference, data security and greater bandwidth capabilities. However, while it is more flexible and sturdy than brittle glass fiber, plastic fiber places strict limits on transmission distances, data rates and environmental operating conditions.

The first two restrictions derive from POF's high attenuation (20 db to 22 db per 100 meters, compared with about 2 db to 3 db per kilometer for multimode glass) and a transmittance window that requires slow-switching, 660-nm LED sources.

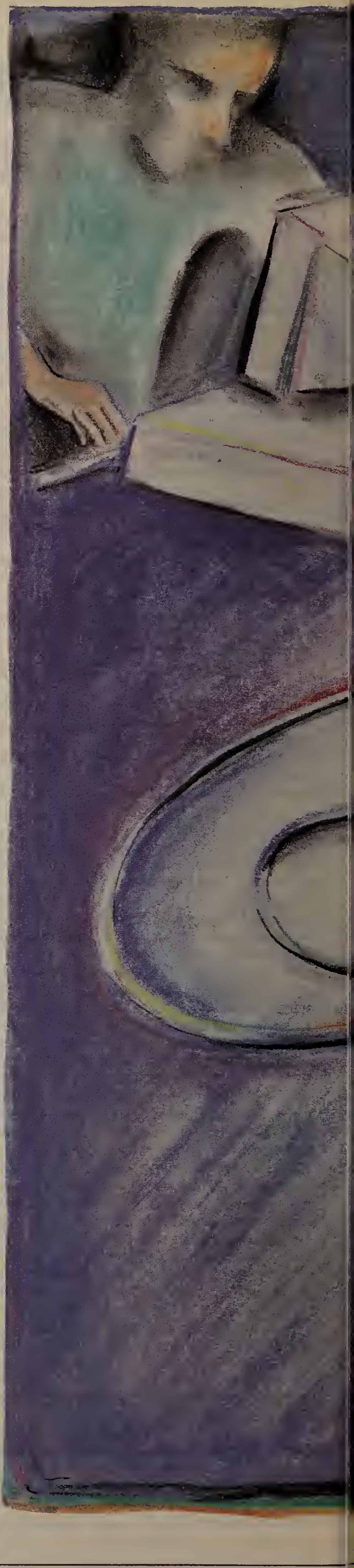
Although POF capable of withstanding 135 degrees Celsius is expected from Mitsubishi Rayon Corp. this year, today's fiber can withstand only about 90 degrees Celsius. Furthermore, POF in its present form is not approved by Underwriters Laboratories, Inc. for plenum installations because it emits a dense toxic smoke when it burns.

Still, POF champions such as Michael Coden, president of Codenoll Technology Corp., a Yonkers, N.Y.-based manufacturer of fiber-optic LANs and LAN components, foresee significant POF penetration in office LAN environments, even for transmission of 100M bit/sec Fiber Distributed Data Interface signals. But most industry pundits feel that plastic fiber will be relegated to short-distance, slower speed data links from a hub or concentrator to a desktop workstation.

An IEEE 802.8 working group recently began discussing the merits and drawbacks of POF, but the standards community con-

(continued on page 47)

Resnick is a free-lance writer based in Sudbury, Mass.



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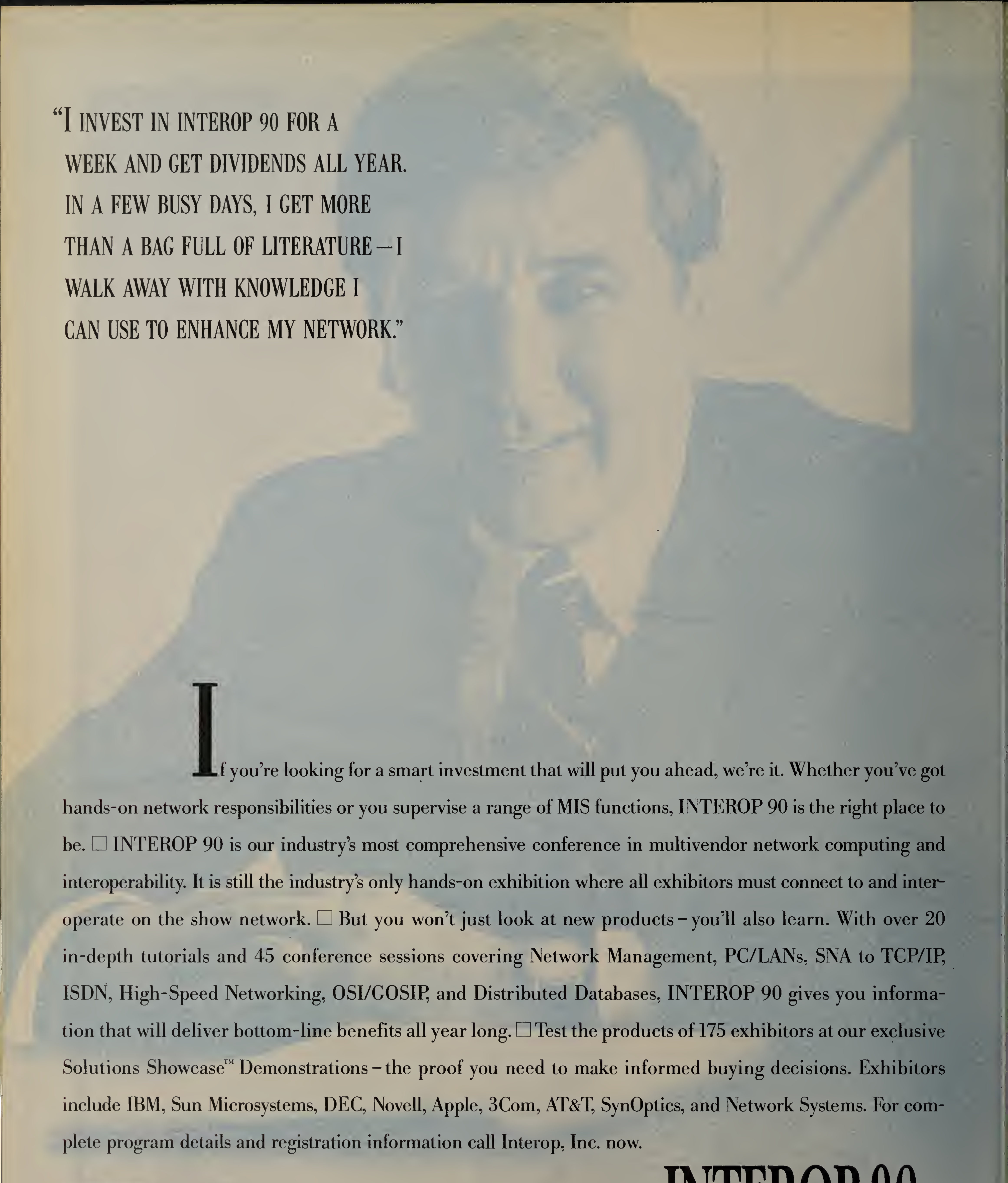

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See The FAXNet Form on Page #41

(continued from page 44)

cedes that much more groundwork must be completed before true standards development can even begin.

The fact that only a handful of POF-based links are commercially available in the U.S. today suggests that plastic is still in its infancy and faces an uphill fight for wide acceptance as a networking medium.

On the cost battleground, POF squares off against twisted pair, which is currently the most common network media connecting desktop computers. One per-port cost comparison between projected POF and unshielded twisted-pair passive star networks suggests that in 24 to 36 months, a POF link will cost less than half of the present cost of a new twisted-pair installation.

According to Neil Tagare, a senior analyst with Kessler Marketing Intelligence Corp. (KMI), a Newport, R.I.-based market research company that specializes in fiber optics, "POF for local-area networks will be the cheapest [alternative] three years from now, at a cost of $474 per Ethernet node." A recently released KMI report on POF estimates that the network cost per node for an Ethernet POF today is $784.

Despite POF's potential cost benefits, user familiarity with already installed twisted pair will be difficult to overcome. Bob Scharf, product marketing manager at Thomas & Betts Corp., says that although he's seeing more user interest in his company's plastic-compatible ST connector, he has yet to see a lot of general interest in local networking with POF.

"People's comfort level with twisted pair is so high and the device support is so strong that users aren't immediately inclined to mine the copper out and squirt plastic in the walls," Scharf says. He suggests that stricter electromagnetic interference (EMI) regulations or higher bandwidth demands may stimulate a changeover to plastic.

K. Scott Gordon, president of via Informationways, a communications and information technology consulting firm in Princeton, N.J., says he thinks it will be difficult for plastic fiber in its present embodiment to beat twisted pair at 10M bit/sec speeds, but he notes that many users won't be able to rely on twisted-pair bandwidth performance forever.

POF is also destined to compete with its higher data rate glass cousin. "When customers need greater bandwidth," Scharf says, "they're switching to glass fiber. They're not picking plastic [as an intermediate solution.]" Forward-looking users who don't currently need the extraordinary bandwidth afforded by glass fiber realize that they may need it later and are reluctant to consider plastic fiber.

Jan Pirrong, president of Chromatic Technologies, Inc., a Franklin, Mass.-based fiber-optic cabler, says that as network designers look toward the future, they're uncertain about plastic fiber's capacity to carry data. Data rate limitations of state-of-the-art POF links are estimated to be between 50M and 60M bit/sec.

The nascent state of plastic fiber network standards presents another formidable barrier. Bob Krzyzanowski, staff engineer at Honeywell, Inc.'s Optoelectronics Division in Richardson, Texas, says, "Everybody's pushing hard to get glass fiber ironed out and into standard form. There has been some resistance to bringing plastic fiber into the current fracas because it might divert the other committees from getting the job done."

Brian Roberts, assistant product manager at Corning, Inc.'s Telecommunications Products Division, concurs.

"As the industry standardizes around 62.5-micron glass fiber because of the FDDI standard, I think network managers will be reluctant to move to other fibers," he says. "They're just getting used to one major technology change and may not be ready for the next one for quite some time."

Quick termination

Still, any technology that significantly cuts the cost of getting fiber to the desktop is bound to raise some interest.

"If users can get something that's robust and cheap to tap, they will buy it," says Mary Modahl, director of network strategy research at Forrester Research, Inc., a market research firm in Cambridge, Mass. "The bottom line to the desktop is that people want the cheapest thing that works," she adds.

Despite POF's potential cost benefits, user familiarity with already installed twisted pair will be difficult to overcome.

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The cost difference between cabled plastic fiber and cabled multimode glass fiber is about 20 to 30 cents per foot, but the real POF savings come from drastically lower termination costs. Some plastic-compatible connectors cost as little as 50 cents each, while connectors for glass fiber are in the $7 to $10 range.

According to Mike Peppler, associate product manager at AMP, Inc.'s Electro-optics Division, plastic fiber's large core size (500 to 1,000 microns) allows more liberal manufacturing standards than are permissible in manufacturing precision glass fiber connectors. Therefore, lower cost materials such as plastic can be used for connector ferrules instead of stainless steel and ceramic materials.

Labor costs are also significantly minimized with POF installations because terminating plastic fiber takes about one-fifth the time required to perform the same procedure with glass fiber.

David Stein, area manager at Southwestern Bell Telephone Co., appreciates the simplicity of plastic terminations.

"You put the connector over the plastic fiber, cut the fiber with a blade, heat it with a hot knife, and that's it," he says. Glass fibers have to be glued into the connector using epoxy and then cleaved and carefully polished.

"POF wins hands down over any other technology when it comes to labor and installation," adds KMI's Tagare.

From autos to offices

Plastic fiber has been used for several years in Manufacturing Automation Protocol and robotic applications, which are characterized by short transmission distances and fiber flexing that exceeds the bendability of brittle glass fiber.

"You can tie plastic in a knot, and it will still transmit data," says Larry Johnson, president of The Light Brigade, Inc., a fiber-optic network system design and installation firm in Renton, Wash.

Omron Electronics, Inc., based in Schaumberg, Ill., markets a token-ring LAN that connects programmable controllers to IBM Personal Computer AT-compatible computers. The system, introduced five years ago, initially transmitted over glass fiber, but plastic fiber is now used because of POF's easy field termination.

Although the automobile market may eventually represent the largest playing field for plastic fiber LANs, POF links may be up and running in the office before they are used extensively in motor vehicles.

"There's a good chance we'll see a plastic fiber LAN in the office prior to seeing it in a production vehicle," says James Orsine, assistant staff engineer for production at Packard Electric, a division of General Motors Corp. that is responsible for developing connection systems for high-speed optical networks in automobiles.

The development synergy among automobile and office applications could lead to joint ventures between automakers and companies hoping to market POF office LAN products.

Jack Olin, director of advanced engineering at Packard Electric, says, "We have a number of people interested in working with us to develop suitable connection systems for office local-area networks. What we have already developed for vehicles is not identical to what the office environment needs, but it is very easily modifiable."

Codenoll and Frankfurt, West Germany-based Hoechst AG have developed a prototype car with an on-board LAN that uses a POF passive star topology to control door locks, lights and power windows.

"POF wins hands down over any other technology when it comes to labor and installation," says KMI's Tagare.

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In the future, optically controlled features such as antilock brakes, fuel injection systems and collision avoidance devices may incorporate plastic fiber, thus eliminating the weight, EMI problems and serviceability headaches associated with copper wiring ("A LAN on wheels," *NW,* March 26).

Codenoll's Coden claims that POF transceivers developed for the prototype vehicle are virtually identical to those that could be used in office LANs. "As we drive the cost of those components down to the level they need to be for automobile applications, they'll make the cost of plastic fiber networking incredibly low," he says.

Codenoll is expected to launch a commercial POF LAN later this year, but the company has already developed two prototype plastic Ethernet LANs. The first, unveiled in November 1987, was a passive star based essentially on the company's Codenet system, a glass fiber network similar to the 10BaseFP passive hub fiber standard currently being voted on by the IEEE 802.3 committee.

Active-hub POF Ethernet

In March 1988, Codenoll demonstrated an active-hub POF Ethernet based on the fiber-optic interrepeater link, the IEEE 802.3 standard for point-to-point Ethernet transmission over fiber. Coden says that these prototypes and two systems now at undisclosed beta-test sites "show the industry that plastic fiber can in fact be used for 10M bit Ethernet-type networks and can meet the requirements of the IEEE."

Despite adequate POF production capacity by companies such as Mitsubishi Rayon, Mobay Corp. and Toray Industries, Inc., there is only one POF-based office LAN currently on the market. Fiberstar, manufactured by Netronix of Petaluma, Calif., is a 2M bit/sec distributed star LAN whose active hub accommodates both plastic and 62.5-micron glass fiber. The plastic fiber portion typically links desktop workstations with an active hub up to 250 feet away, and glass is used for longer backbone links.

The Fiberstar hub supports 16 fiber-optic ports, and each personal computer on the network has a user-installable adapter card connected to the hub via plastic fiber. With the interconnection of two Fiberstar hubs, as many as 240 nodes can reside on a network.

Netronix bridges allow users to integrate Fiberstar subnetworks into larger nets that use Ethernet, thinnet, AT&T's Starlan and the IBM Personal Computer broadband architecture supporting the IBM Personal Computer network card.

The Fiberstar network supports Novell, Inc.'s NetWare, Transmission Control Protocol/Internet Protocol and applications based on Network Basic I/O System-compatible operating systems.

Fiberstar adapter cards for the IBM Personal Computer AT bus cost $595 each; the Micro Channel Architecture (Personal System/2) cards cost $875 each, and the 16-port Fiberstar hubs sell for $2,195 each. The bulk of Fiberstar systems now in use are located at various facilities of AMP, which holds a financial interest in Netronix.

Netronix President Art Jopling explains that Fiberstar provides 2M bit/sec throughput by writing directly to the direct memory access (DMA) channel in the adapter card.

"When a packet comes in, it is transferred directly via DMA to memory in the host machine," Jopling says. He points out that most 10M bit/sec Ethernet boards transfer data into buffer memory on the board and then to the host, an additional memory move that slows data rates to between 1M and 1.5M bit/sec.

The company claims that benchmarks comparing Fiberstar with other 4M bit/sec token-ring and 10M bit/sec Ethernet nets show the Netronix product per-

(continued on page 48)

All tied up?

continued from page 47

forming favorably in terms of throughput for applications running between a personal computer and its disk server.

But Coden says he questions the rationale of bringing a 2M bit/sec system to market. "We don't see any users looking to go to lower speeds; we see them looking only to go to higher speeds," he says. This observation is corroborated by some multimode glass fiber vendors who see competitive pressure in LAN markets coming more from single-mode fiber's data rate capacity than from plastic fiber's low cost.

"One reason people choose fiber optics is to assure [the system's ability to be upgraded]," says Patricia Forti, director of sales and marketing for SpecTran Corp., a Sturbridge, Mass.-based fiber manufacturer specializing in glass multimode fiber.

"Because users are building to the FDDI standard now, we're more concerned that multimode [glass] fiber will be replaced by single-mode [glass] fiber rather than by plastic fiber."

The 660-nm, red-light LEDs used as sources with most POF systems facilitate troubleshooting of cables because they emit visible light, but the system bandwidth and, therefore, the data rate of POF links is limited by the slow switching of these devices.

> "It's not clear that the world needs another standard," Fedora says.
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Despite distance constraints, Coden says he is certain that high-speed LANs will operate over plastic fiber. "We're convinced that we will be running FDDI on plastic fiber in less than two years," predicts Coden, though he agrees that faster switching 660-nm LEDs need to be developed first.

The connection between low-cost components and practical POF LANs is also stressed by Terry Lockyer, a strategic planning manager for Westborough, Mass.-based BICC Data Networks, Inc.

"We basically have the capability to do a plastic LAN now," he says. "It's just a matter of finding the component technology to do it economically." BICC has not announced plans for commercial introduction of its plastic LAN currently under development.

Such components are said to be on the horizon. Codenoll is developing a fast-switching 660-nm, high-power LED. Engineers have pared device rise and fall times down to 5 nsec, and Coden expressed certainty that speeds of 2 or 3 nsec are possible and will make POF usable with FDDI.

Steve Whitaker, a fiber-optic product specialist for Honeywell's Optoelectronics Division, says his group is working on a faster visible-light LED that cuts rise and fall times. Still, Whitaker says, "The factor limiting speed on plastic fiber has been the LED in the past, and it may continue to be."

Barriers to penetration

Unfamiliarity with the technology and the lack of networking standards for plastic optical fiber have already incited user skepticism. "With Fiberstar, we get more interest than sales, relative to our other networking products," says John Lucan, vice-president for sales and marketing at Netronix. He concedes that "most people are reluctant to venture into new areas."

According to Ron Fedora, manager of strategic programs at Hoechst-Celanese Corp. in Somerville, N.J., the same network parameters addressed in other LAN standards — topology, medium, bandwidth and protocol — may eventually be hashed out for POF networks. Fedora is also chairman of the recently formed IEEE 802.8 working group on POF.

"I can't see any reason why plastic fiber and POF networks would be subjected to a different set of specifications," he says. "There will probably be differences in degree, but I think the standards will generally be quite similar."

Nevertheless, Fedora says he isn't sure the process will even get that far. "It's not clear that the world needs another standard or that POF will be able to carve out a niche," he says.

By next spring, Fedora anticipates that the 802.8 committee will have a good idea whether interest is high enough to proceed with the standards setting. "I can't see it taking less than two years from that time to come to a standard," he says. "That puts us in the 1993 time frame at least."

At the working group's meeting, HP's Hanson presented a modeling scheme for specifying plastic link parameters. Developed from approximate equations he prepared for FDDI links and modified for POF, the model helps specify characteristics such as overall power budgets and spectral width and time responses of sources. With such modeling aids, a LAN designer will be able to integrate POF links into the architecture and protocols of a larger LAN environment.

Fedora's prescription for POF standardization includes users exerting pressure to get a standard and more technical input from producers.

"The industry for the supporting components — the transmitters, receivers, couplers and connectors — has to grow along with ongoing efforts to improve the attenuation and bandwidth of the fiber," he says.

KMI's Tagare says that until standards are clearly defined by the IEEE committee, POF growth will stall "because prices won't come down unless there is industrywide standardization."

Tagare also cites user ignorance as a factor inhibiting POF's acceptance into the mainstream. "One reason [POF] technology is being held back is that people are not knowledgeable about the economics or about what it can and cannot do. We are trying to tell manufacturers that they not only have to get the technology up-to-date, they also have to educate users," he says.

Via Informationways' Gordon agrees. "Even when users get the product, it will come down to the long hard exercise of educating the market," he says. "The companies promoting and educating are small companies that may have a harder time selling the world on plastic fiber LANs."

But getting the product into the marketplace must precede user education, according to Forrester Research's Modahl.

"The only thing that will overcome user skepticism is product on the shipping docks," she says. "I don't think user attitudes are too important to this market. It's a technology question."

Coden says he is convinced that within a few years, two types of networks will predominate. "There will be plastic fiber for work groups and glass fiber in backbones. And there won't be any copper wire used for signal carrying by the end of the decade," he predicts.

Coden explains his vision by saying that the U.S. has become a more image-oriented society with high-bandwidth requirements on computer networks being driven by computer-aided design and manufacturing as well as image processing applications. "As more people buy high-bandwidth technology," he reasons, "volume goes up and prices come down, allowing users with lower budgets to try the application."

But POF data rate limitations may prevent the technology from becoming a universal networking panacea.

> Tagare cites user ignorance as a factor inhibiting POF's acceptance.
>
> ▲▲▲

"We have no intention of using plastic now," says Kevin Walters, director of office automation at Warren, Mich.-based Lintas: Campbell-Ewald Co., an advertising agency with 15 miles of glass fiber cable connecting 350 personal computers on a passive star network. Walters has already ruled out plastic for linking the additional 100 personal computers that will be added to the network later this year.

"We do a lot of image manipulation, and we're going to need a lot of bandwidth over decent distances," he says. "If we had simple data requirements, centrally located hubs and if we weren't planning to put video, voice and data on the same cable, then plastic fiber might make sense."

On the other hand, according to Southwestern Bell's Stein, the overwhelming cost advantages of plastic fiber termination are enticing for some new installations. "When plastic fiber is proven for general office applications, which I've been led to believe will be in about two years, we'll give it serious consideration," he says.

Southwestern Bell's corporate glass fiber Ethernet is currently arranged in clusters of eight workstations connected to a wiring closet by four 85-micron glass fibers. Stein notes that a POF link would eliminate the need for the approximately 30 $700 to $900 fan-out units now being used to distribute signals.

"We could run however many fibers we need to every desk and make a direct Ethernet connection," he says. "If it's true that you can buy a plastic fiber-optic connector for under $1 and that it would take an installer less than five minutes to connect it, you could save a lot of money."

BICC's Lockyer suggests that POF's future is largely dependent on whether it can be upgraded to accommodate FDDI.

"One of the criticisms of plastic fiber has been that it's merely a substitution for unshielded twisted pair," he says. "If we could show it to be upgradable to 100M [bit/sec], then we could run tomorrow's generation of FDDI networks on it. That would be a big selling point."

"The problems have been identified," Hanson concludes. "Now the question is whether the vendors are going to be motivated to supply the answers."

FCC should revisit collocation

continued from page 43

tions or lotteries, these approaches also raise difficult issues as means of implementing CEI."

However, the actual nature of the "difficult issues" is never addressed.

In general, the arguments pertaining to possible hazards of physical collocation are either irrelevant or minimal. The fact that the carriers already provide physical collocation to companies on a discriminatory and limited basis is evidence that potential problems could be overcome. In fact, at least one regional Bell holding company has already issued guidelines for collocation.

In addition, collocation involves more than performance and economic issues. Perception is also a factor. Carriers' ability to offer physical collocation might be *perceived* by customers as being better, even though it may not be — assuming for the moment the FCC is correct in its conclusions regarding virtual collocation.

Perceptions among buyers, whether they are typical consumers or sophisticated businesses, are powerful forces affecting decision making, and the opportunity to collocate is not immune to this internal buyer prejudice.

It appears that even Markey's draft bill on RBHC equipment manufacturing and information services provision suggests nondiscriminatory collocation as a remedy to the controversy, at least on the local level.

Specifically, in the draft's "Commission Revision of ONA Order" section, it states that "The commission shall ensure that telephone operating companies not discriminate in offering tariffed and nontariffed features, functions, and capabilities." Hence, the bill suggests that on the local level, carriers would be required to provide collocation on a nondiscriminatory basis.

Nondiscriminatory collocation, used in conjunction with virtual collocation to handle central office overflow, will result in an equitable economic environment for everyone. The FCC should require nondiscriminatory collocation, on the local and interexchange levels, in the interest of the long-run benefits that result from equal competition.

Letters

continued from page 43

offer random access, an advantage over streaming tape.

The costs of these devices are low, especially when compared with the costs of the special billing programs the carriers offer. Media costs are comparable when measured against paper or EDI costs of the same information. Finally, when using this information with a data base program or report writer, telecommunications expense management moves one step closer to reality.

David Goodtree
Manager of
telecommunications
Tweeds, Inc.
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LAN TEST SERIES

Bridging Novell Ethernet and token-ring nets

Settling their differences

Here's a guide to the tricky business of making the connections between dissimilar nets.

CONTINUED FROM PAGE 1

The four Ethernet-to-token-ring bridge manufacturers are CrossComm Corp., IBM, Novell and Ungermann-Bass, Inc. Of these, only CrossComm and Novell can connect Novell networks using a variety of network interface cards.

The Ungermann-Bass bridge links NetWare Ethernet and token-ring networks, but it only supports the Ungermann-Bass token-ring network interface card. The IBM and Ungermann-Bass bridges link Ethernet and token-ring LANs under Microsoft Corp.'s LAN Manager.

The problem with bridging between Ethernet and token-ring LANs is that they use different packet formats. Therefore, Ethernet-to-token-ring bridges must convert packets from one format to the other.

New bridge test needed

Bridge performance is typically reported in terms of filtering and forwarding rates, usually expressed in packets per second. Unfortunately, this method of reporting is ambiguous because the sizes of the packets may differ. Actual packet sizes can range from about 20 bytes to about

(continued on page 50)

Mick is vice-president of LanQuest Group and general manager of LanQuest Labs, a division of LanQuest Group in San Jose, Calif.

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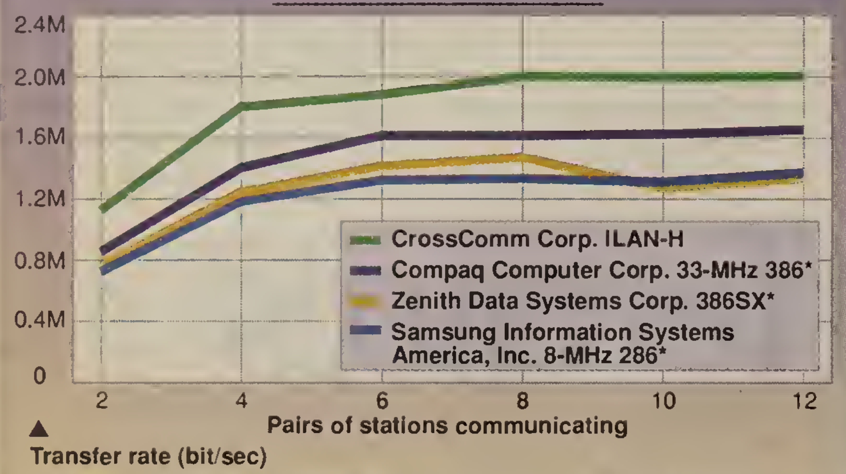
(continued from page 49)

1,000 bytes. Current packet size limits are 1,500 bytes for Ethernet and 4K bytes for 4M bit/sec token ring. Also, with token ring, management overhead can require as much as 22 bytes per packet.

Unfortunately, no performance test has been available to specifically measure throughput in terms of raw data without the overhead imposed by the process of moving it over the LAN and across the bridges.

Data transfer rate

Figure 1



*Running Novell, Inc.'s external bridging software in NetWare.

The test measures throughput in bits, not packets, per second. This allows users to directly compare bridge performance.

GRAPHIC BY SUSAN SLATER SOURCE: LANQUEST LABS, SAN JOSE, CALIF.

For this article, LanQuest Labs developed a test suite to assess the data transfer rate of the bridges by looking at both unidirectional and bidirectional transfers. This suite provides a uniform, easily understood metric and eliminates the need to qualify results with packets, acknowledgments and other intervening variables.

Capabilities of Testmaster

This test is one of the first to use LanQuest Labs' Testmaster, a modular test environment running under Network Basic I/O System.

Under the control of a master station, individual test stations can be instructed to perform predefined DOS and NETBIOS test programs. The master station provides start synchronization and collects performance data from individual test stations at the conclusion of the test run.

Running under Testmaster, the bridge and router test suite uses Peer, a NETBIOS program that measures network component performance using peer-to-peer communications. The test allows scripted data transmissions between pairs of stations. The scripts control the size of the data block to be transmitted — which can vary from one to 8K bytes — and the number of blocks to be transmitted between any two stations. The master station and script can control any number of station pairs.

A single message from the master starts all sending stations simultaneously. Throughput, measured in bits per second, is automatically calculated for each sending station. The calculations are based on the data transferred, and ignore packet overhead.

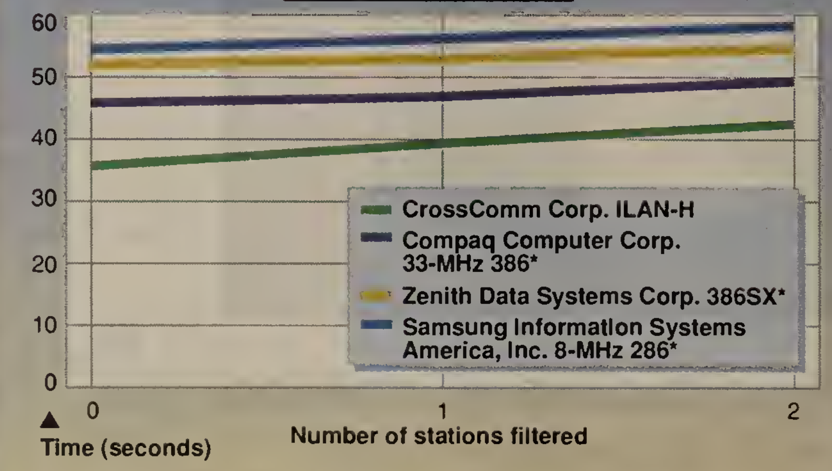
Fixed-size data transfers — 2,000 1,000-byte blocks — were performed between pairs of stations, with one member of each pair residing on each side of the bridge. The packet size was selected to generate large uniform data packets. The number of pairs participating in the test was varied to control the work load of the bridge.

The actual test was designed to measure bridge performance and network impact in a variety of load conditions. The test platform consisted of a 12-node Ethernet LAN and a 12-node token-ring LAN, the test bridges, two network analyzers (one to monitor each network) and a manager station to run the experiments.

The Ethernet LAN consisted of 12 Samsung Electronics America, Inc. 8-MHz 80286-based computers, each equipped with a 3Com Corp. Etherlink II adapter. These workstations were connected with two-meter lengths of coaxial cable. The manager station was identical to the workstations and was connected to the Ethernet LAN.

Filtering effects

Figure 3



*Running Novell, Inc.'s external bridging software In NetWare.

For all four bridges, adding a filtering load reduced throughput by 1% to 16%.

GRAPHIC BY SUSAN SLATER SOURCE: LANQUEST LABS, SAN JOSE, CALIF.

The token-ring LAN consisted of 12 IBM Personal System/2 Model 50Z computers (10-MHz 80286-based microcomputers), each equipped with an IBM 4M/16M token-ring adapter set to run at 4M bit/sec. The network was wired with IBM Type 1 cabling and IBM 8228 concentrators.

Network analyzers were connected to each LAN for monitoring operations and for capturing test data in case troubleshooting was required.

The test protocol

Test scripts were written to examine performance of the bridges in five different situations: forwarding data from Ethernet to token-ring, forwarding data from token-ring to Ethernet, forwarding data in both directions simultaneously, forwarding data in both directions simultaneously while filtering from a constant broadcast of 1,000-byte data packets between two stations on each network and forwarding data in both directions while filtering from a constant broadcast of 1,000-byte data packets being exchanged among four stations on each network.

The nonfiltered tests were run under six loads: two, four, six, eight, 10 and 12 pairs of workstations with one station of each pair transmitting 2,000 1,000-byte blocks of data to the other. For the Ethernet-to-token-ring and token-ring-to-Ethernet tests, all stations sent data in one direction. For the simultaneous transmission tests, the two halves of the stations transmitted data in opposite directions. The filtered tests were run under loads of two and four pairs of workstations.

The tests were performed on two bridges: a Novell external software bridge and a CrossComm ILAN-H. The Novell bridge is a software program run on a workstation equipped with two adapter cards, one connected to each of the networks.

Creation of a Novell external bridge requires setting up a workstation with two network interface cards (in our case, an Ethernet and a token-ring) and executing a program called Bridge. The bridge software is generated via a Novell bridge-generation program called BRGEN, which is included with the NetWare operating system. The bridge software must be custom-generated for each bridge by defining the network environment, including the type of network interface cards to be used in the bridge.

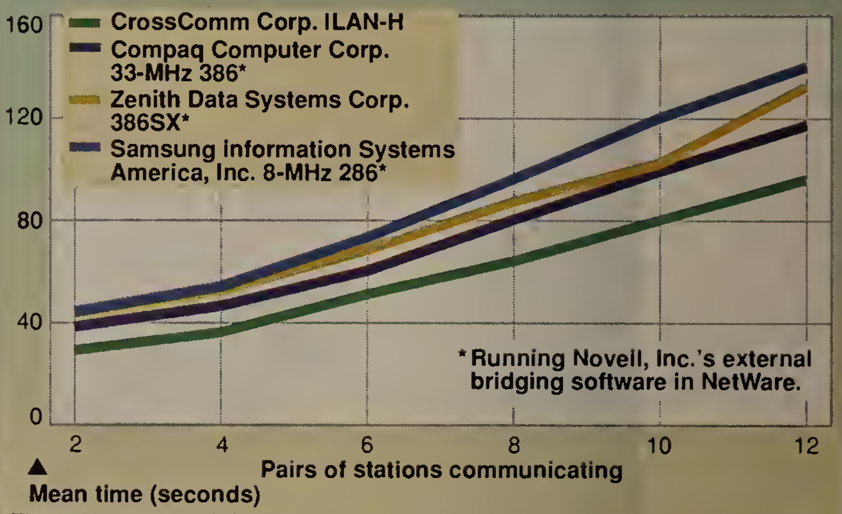
The External Bridges Supplement, which is included with NetWare documentation, contains information on how to configure the Novell external bridge.

The Novell bridge software requires only 640K bytes of random-access memory and a floppy disk. However, bridge performance depends on the power of the host CPU. We decided to vary the Novell bridge's performance parameters by varying the power of the processor.

We built three Novell-based bridges, each based on a different computer: a Compaq Computer Corp. 33-MHz 286, a Samsung 8-MHz 286 and a Zenith Data Systems Corp. 386SX. The Samsung 8-MHz 286, incidentally, was identical to the workstations used for the Ethernet LAN. Each bridge used a Novell NE2000 Ethernet adapter and an IBM 4M/16M token-ring adapter running at 4 MHz. The Novell bridges have a packet size limit of 512 bytes.

Transmission speed

Figure 2



*Running Novell, Inc.'s external bridging software in NetWare.

The test measured the time to send 2,000 1,000-byte data blocks between the two LANs.

GRAPHIC BY SUSAN SLATER SOURCE: LANQUEST LABS, SAN JOSE, CALIF.

The cost of the adapters is constant across all three Novell bridges. The retail price for the NE2000 is about $200, according to advertisements in the June 10 Computing Section of the *San Jose Mercury News* and calls to a local discount retailer in San Jose, Calif. The retail price for the IBM 4M/16M is about $600.

The adapter cost could be reduced by at least $300, using a different 4M bit/sec token-ring adapter; however, this would change the performance curves of the test. The retail prices for generic workstations of the type used in our test are $500 for a generic 80286-based workstation, $900 for a generic 16-MHz 80386SX and $2,000 for a generic 33-MHz 80386-based workstation.

Therefore, based on our prices, it's possible to build Novell bridge platforms relatively similar in performance to those used in our tests for $1,000 to $1,300 for an 80286-based bridge, $1,400 to $1,700 for a 16-MHz 80386SX-based bridge and $2,500 to $3,100 for a 33-MHz 80386-based bridge.

The CrossComm ILAN-H is a new bridge that just began shipping in May. The bridge acts as a protocol converter to translate between the Ethernet and token-ring packet formats. It supports three communications protocols: IEEE 802.2 logical link control (LLC), NetWare and Transmission Control Protocol/Internet Protocol.

The ILAN-H will handle packet sizes up to 1,500 bytes — the Ethernet maximum — when bridging Ethernet or Ethernet and token-ring networks, and up to 4,096-byte packets when bridging token-ring networks.

The ILAN-H can function as a local bridge and as a remote bridge. As a remote bridge, it supports both RS-232 and T-1 wide-area network links. However, in our test, we worked with the ILAN-H only as a local bridge.

It can be configured to bridge multiple networks; the ILAN-H used in our test came factory-configured to bridge two Ethernets and one token-ring network. For our test, however, we only needed to bridge one Ethernet and one token-ring network, so we did not use the second Ethernet interface.

Our unit also came with a modem for RS-232 remote bridge operation. The ILAN-H can be managed remotely through CrossComm-supplied ILAN management software.

The ILAN-H is priced between $7,900 and $13,000. Our test unit had a retail price of $7,900.

The results

Configuring the Novell bridges was simple. We installed the two adapter cards in the workstation, booted it and executed the bridge program. Next, we prepared a single boot disk for each bridge containing IBM PC-DOS 3.3 and the Novell bridge software. Then we brought all three bridges up and running.

Once the bridge program was started, it reported connection to the two networks. There was no further feedback during regular operation. However, the lack of

(continued on page 59)

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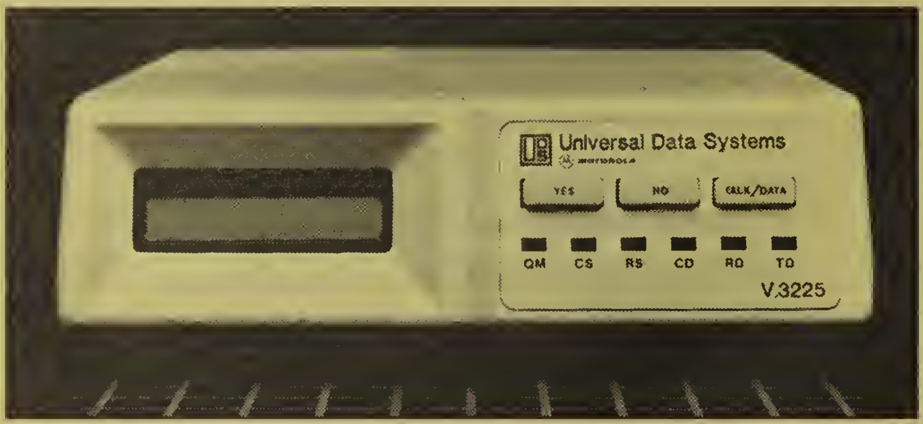

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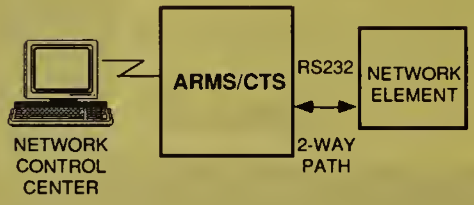

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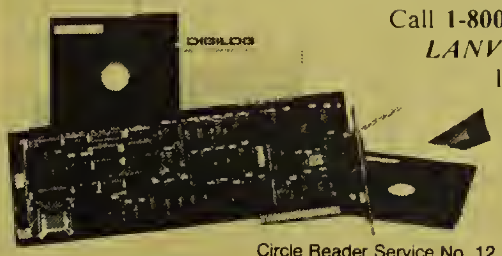

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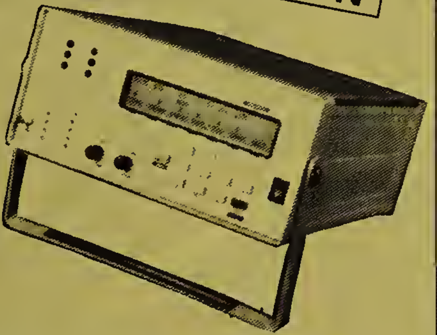

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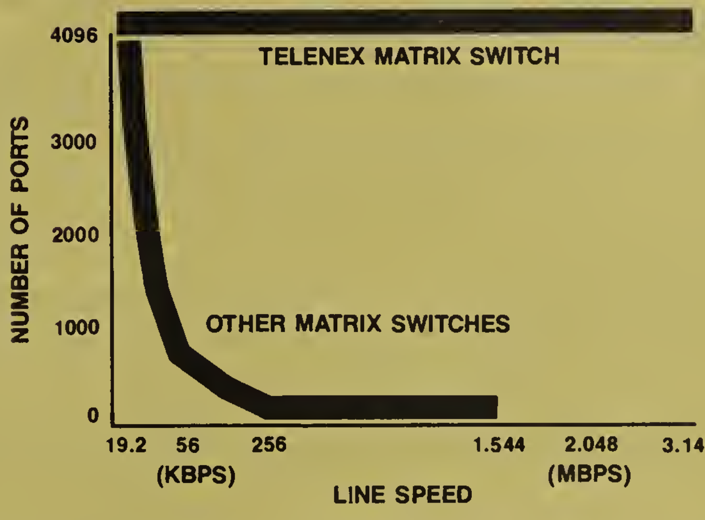

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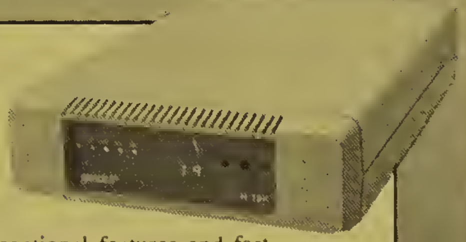
NW June 90

MODEM



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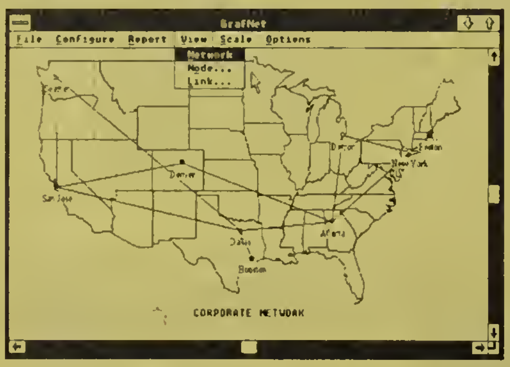

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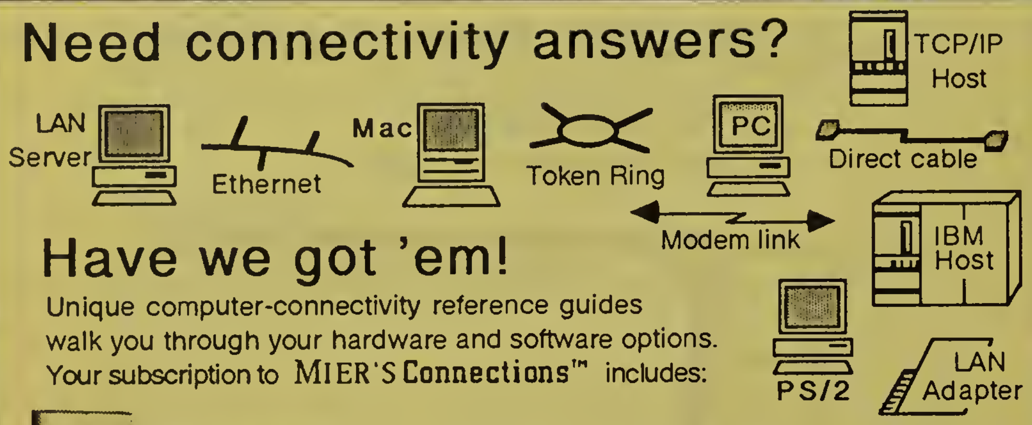

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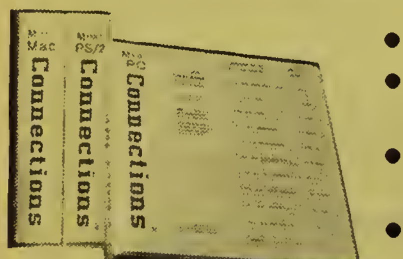

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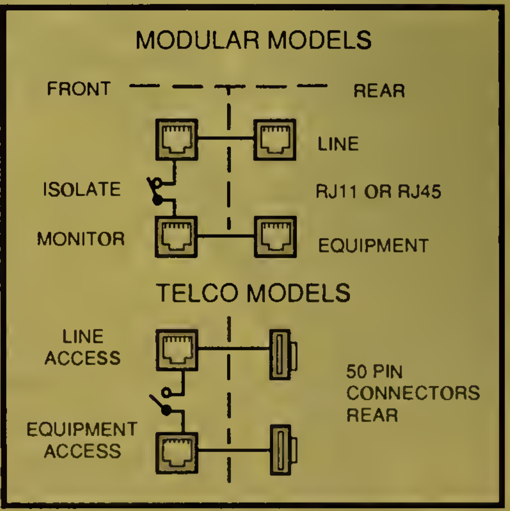

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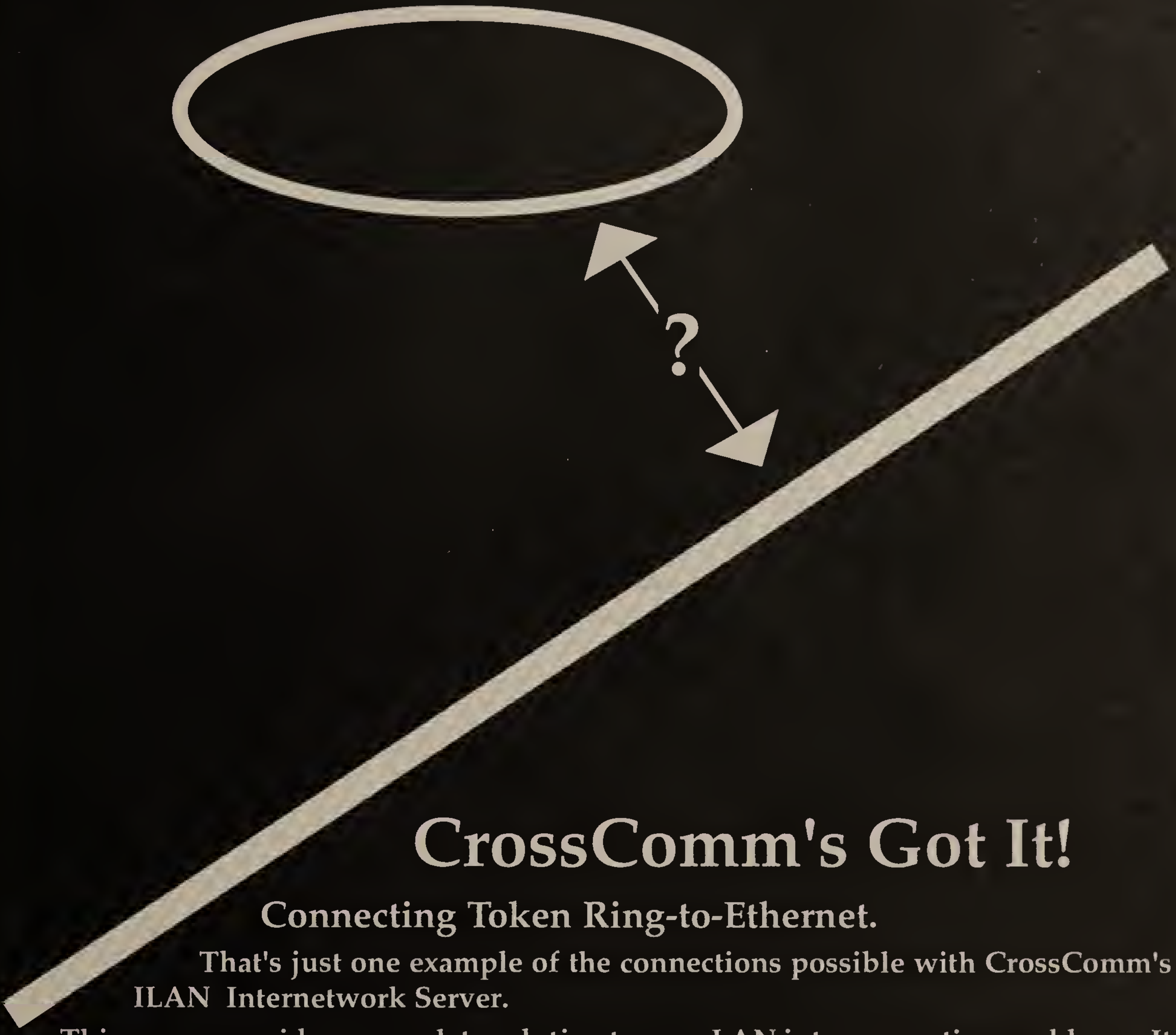

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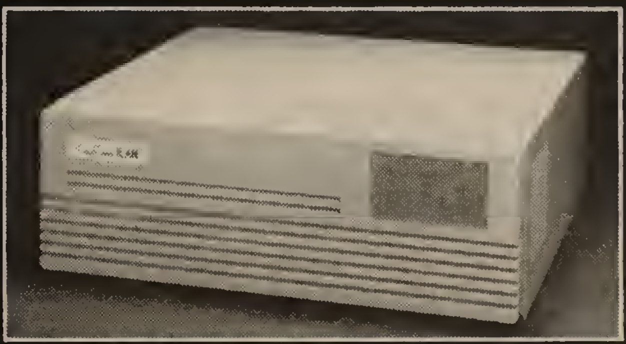

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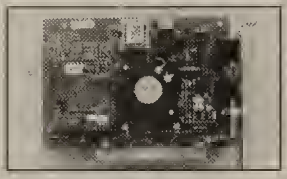

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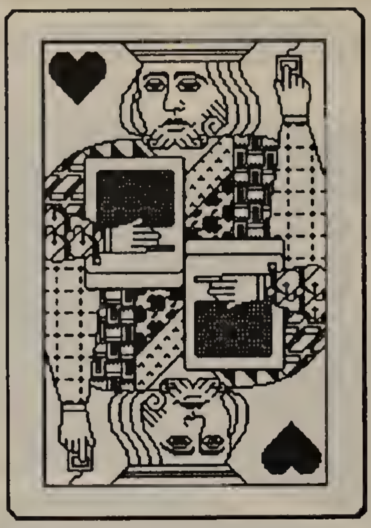

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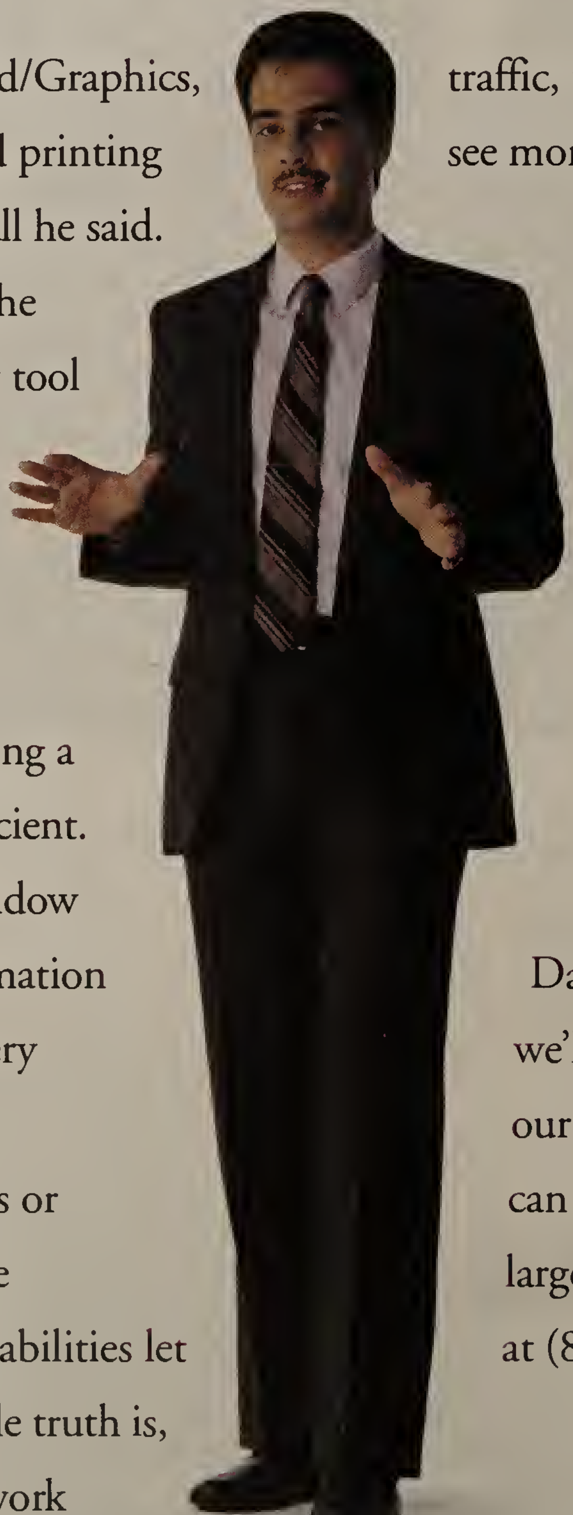

That's what Damian Drewek of Quad/Graphics, Inc., the nation's largest privately held printing company, told us. In fact, that's not all he said. Damian went on to emphasize how the WANmanager network management tool saves time and resources. But that's exactly what you should expect from Vitalink, the LAN internetworking specialist you can trust.

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Settling their differences

continued from page 50

feedback was not a problem for our project because we were monitoring all bridge operations with network analyzers.

The ILAN-H comes self-contained in a single chassis. There is no drive or monitor; all program support is in firmware, and all feedback is via front-panel LEDs or the remote management software.

The ILAN-H was simpler to install than the Novell bridges. We merely had to determine an appropriate location for the ILAN-H, connect it to the alternating current power, connect it to the networks and turn the power on.

Forwarding performance

The differences in the forwarding-only tests are quite pronounced. All four bridges reached maximum performance at six pairs of stations when forwarding in one direction. The CrossComm ILAN-H showed the highest transfer rate, followed by the Compaq 386-based Novell bridge. Surprisingly, there was very little difference in performance between the 386SX and 286 machines.

Another test sent data in both directions across the bridge. In this test, workstations on the token-ring net sent data to workstations on the Ethernet LAN, while the same number of stations were transmitting data from the Ethernet to the token-ring LAN. The test simply sent the data back and forth; the bridge did not perform any filtering of data. That is, all of the network traffic generated on the Ethernet LAN had destination addresses on the token-ring LAN and vice versa.

The results of the bidirectional forwarding test followed a similar pattern to the single-direction token-ring-to-Ethernet or Ethernet-to-token-ring test.

All bridges reached maximum performance at eight pairs of transmitting stations. Maximum transmission rates at 12 pairs ranged from a high of 2.068M bit/sec (CrossComm token-ring-to-Ethernet) to a low of 1.209M bit/sec (386SX-powered Novell token-ring-to-Ethernet, see Figure 1, page 50).

To contrast this, we ran the Peer tests on two, four and six pairs on each network alone to show the potential transfer rate. The Peer test will push the 4M bit/sec token-ring to almost maximum capacity (3.255M bit/sec of data transfer). However, it generates a load of only 5.566M bit/sec on a 10M bit/sec Ethernet with six pairs. Eight pairs will push Ethernet to almost maximum capacity — a little more than 8M bit/sec.

Figure 2 on page 50 shows that performance will begin to slow as soon as more than two pairs of users try to transmit large files across the bridge — a situation similar to our test environment.

After performing the bidirectional test, which transmitted all of the network traffic generated on one network to the other, we performed a test that forced the bridges to filter the data in addition to forwarding it. In this test, as before, some of the network data was destined for the other LAN, and some was destined for workstations on the same LAN. Adding a filtering load to the bridges reduced throughput by 1% to 16% (see Figure 3, page 50).

Surprisingly, filtering had the most deleterious effect on the fastest bridges.

CrossComm's product was the performance champ, outpacing the other bridges by margins of up to 25%. It performed best when moving data from token-ring to Ethernet, generating data throughput of about 2M bit/sec, compared to data throughput of about 3.2M bit/sec for 4M bit/sec token-ring and 8.2M bit/sec for Ethernet.

Not surprisingly, the Compaq 386 provided the most powerful platform for the Novell bridges. For all its power, the CrossComm bridge showed the greatest degradation in the filtering tests, although it still performed better than any of the Novell bridges.

The options for bridging Ethernet and token-ring NetWare LANs are surprisingly limited. Only Novell and CrossComm offer bridging solutions that support a variety of token-ring network interface cards. For users willing to work exclusively with Ungermann-Bass token-ring network interface cards, the list of manufacturers expands to include Ungermann-Bass.

The CrossComm ILAN-H, with a data transfer rate of 1.7M bit/sec to 2M bit/sec, offers the highest performance of the bridges tested. The Novell bridges offer less performance, with actual performance rates varying from 1.1M to 1.7M bit/sec, depending on the computer used for the bridge.

In actual operating conditions, performance will be somewhat worse since intra-LAN traffic predominates over inter-LAN traffic with the typical LAN. Users will have to share the bridge throughput, and response times will always be slower than with a local server. How much slower depends on the number of users communicating across the bridge and the volume of data being transferred.

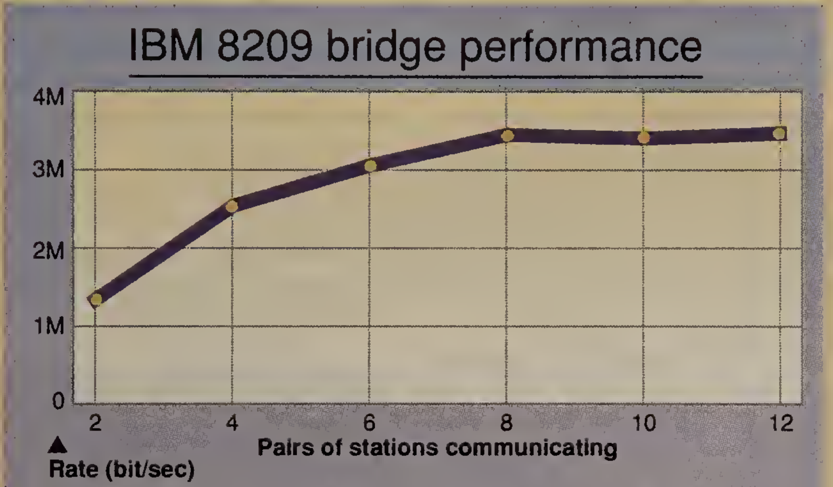
The IBM 8209 stands in a class by itself

The IBM 8209 bridges one token-ring local-area network to one Ethernet. It is a single, stand-alone box with all programming in firmware. Front-panel LEDs provide feedback on operation and information for troubleshooting should the bridge fail to work. The bridge is plug and play — plug it in, connect the network cables, turn it on and away it goes.

Once we mastered the setup on our test workstations, the bridge worked flawlessly. We found our setup phase and tests ran more quickly on the 8209 (see graphic). Under Novell, Inc.'s Internetwork Packet Exchange (IPX), our tests generally required about two minutes to set up all the stations before data transmission started. With the 8209, the setup process took about 20 seconds. However, we can't say whether the performance differences are due to the bridge or to the different protocols because we did not have a second bridge to test against the IBM bridge under these conditions.

Similarly, the performance data for the IBM 8209 can't be directly compared with the results for the CrossComm Corp. and Novell bridges because they were generated in a different network environment.

— *Colin Mick*



The IBM 8209 Ethernet-to-token-ring bridge test, run under LAN Manager, yielded the fastest data transfer rates. The results, however, cannot be compared directly to those found for the other bridges since a different operating system was used in this test.

GRAPHIC BY SUSAN SLATER

SOURCE: LANQUEST LABS, SAN JOSE, CALIF.

UB adapters act as processors

continued from page 23

"If a PC encounters a critical error, the adapters can report the problem to the network administrator," Moore said. "By contrast, if the network management software and the protocol software are resident on the PC, errors could be overlooked."

Both adapters feature a remote boot capability, which allows the use of diskless workstations. They also contain built-in IBM 3270 and Digital Communications Associates, Inc. Irma terminal-emulation boards.

The NIUpc/EOTP and the NIUps/EOTP both support DOS Version 3.1 or above, Microsoft Corp.'s Microsoft Windows 3.0 software and the OS/2 operating system in TCP/IP and Xerox Corp.'s Xerox Network Systems environments.

Both products are available now and cost $1,095.

Novell backing

In related news, Ungermann-Bass — one of the top OEMs of Microsoft's LAN Manager product — also announced that its NIUpc/EOTP and NIUps/EOTP adapters are equipped with drivers that support Novell's ODI.

ODI, developed by Novell and several other companies including Apple Computer, Inc., is a standard interface between network adapters and various network operating systems.

ODI makes it possible for multiple protocol stacks — including NetWare's native Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) protocols — to share the same network adapters. The interface allows a single server interface card to support a mix of disparate workstation adapters on the same LAN.

The new drivers will allow users of the company's Net/One NIUpc and NIUps adapters to access NetWare servers and OS/2 workstations on NetWare 386 LANs for the first time, according to Roger Bertmann, Ungermann-Bass' vice-president of marketing.

> ODI makes it possible for multiple protocol stacks to share the same network adapters.
>
> ▲▲▲

"We chose LAN Manager as our strategic network operating system, but our users — most of whom have hundreds or thousands of nodes in their nets — often use NetWare as well as LAN Manager. UB will support both environments," Bertmann said.

He noted, however, that the company's new ODI drivers will not support connections to DOS workstations on NetWare LANs.

"We'll continue to support DOS users with their NetWare 2.15 drivers, which provide simultaneous access to NetWare, Net/One LAN Manager and TCP/IP nets," Bertmann said.

The NetWare 386 and OS/2 Requestor ODI drivers cost $50 per server and are available 30 days after receipt of order.

RBHCs buy New Zealand telco

continued from page 4

are probably investing in New Zealand so that they can experiment in businesses such as cable television and electronic publishing, which they believe they can turn a profit in but are not currently allowed to offer in the U.S.

RBHC executives have said in the past that regulatory restraints on the kinds of businesses they can pursue in this country are forcing them to look for overseas investments.

Among other foreign ventures, Nynex Corp. last month received two licenses to operate cable television companies in the U.K. Those cable companies also supply local telephone services.

The RBHCs are also among the leading bidders to purchase ownership stakes in Mexico's national carrier, Telefonos de Mexico, and to build multimillion-dollar cellular telephone nets in Europe.

Benefiting users

Some observers point out, however, that U.S. users with operations in New Zealand will benefit if Ameritech and Bell Atlantic use their investment to improve New Zealand's public network.

Kiran Chhaganlal, company secretary and corporate solicitor of Telecom Auckland, Ltd., the operating subsidiary of Telecom of New Zealand, said that Ameritech and Bell Atlantic will strive to make New Zealand more attractive as a hub for international networks. He said the cash infusion may be used to improve the quality of New Zealand's domestic and international services.

Chhaganlal added that the privatization of Telecom of New Zealand is only the latest in a series of moves that will make New Zealand a better site for international net hubs. Among other changes, the government recently authorized a second carrier to compete with Telecom of New Zealand. This carrier is expected to begin operating by next year.

In anticipation of the competition, Chhaganlal said that Telecom of New Zealand is becoming more responsive to the needs of large business users.

Barton Crockett contributed to this story.

Brokerages to unite for volume

continued from page 2

Malone declined to speculate about the value of the contract, saying it is too early to tell. He did say, however, that participation in the project would be open initially to any of the SIA's 600 member brokerage firms, which include all of the major securities trading companies on Wall Street.

"Basically, we're just trying to see what kind of volume discounts we can get by working together," he said.

Malone added that companies not belonging to the SIA might be allowed to join the consortium once the contract is finalized.

Other initiatives

The custom network contract complements other efforts by SIA members to save money by cooperating in purchasing and operating network facilities.

For example, in December 1988, the SIA signed a contract with New York Telephone Co. for a fiber-optic network interconnecting 22 SIA member companies and two nonmembers in the New York metropolitan area ("N.Y. Tel awarded contract to build securities network," *NW*, Dec. 26, 1988/Jan. 2, 1989).

According to Pim Goodbody, staff advisor to the SIA's telecommunications and information management committee, this contract enables participating companies to receive up to 50% off the cost of private voice circuits in the New York area. He added that 73 more companies are likely to be added to the network within a few weeks.

According to Malone, SIA members are also discussing ways to save money by sharing capacity on local-loop private lines carrying data traffic from the firms to such organizations as stock exchanges and trade clearing companies. Because several SIA members send data to the same locations, they could conceivably save a great deal of money by pooling traffic onto shared circuits, he said.

> "Basically, we're just trying to see what kind of volume discounts we can get by working together," Malone said.
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In addition, SIA member firms are examining ways to establish common network standards for interfacing with on-line trading data services and for exchanging data with stock exchanges and trade clearing firms.

"We figure that by standardizing on things like X.25 or SNA, we can save people a lot of money," Malone said.

Disaster recovery service

Separately at the SIA conference, Nynex Corp. announced that it will begin marketing a new disaster recovery service offered by a New York-based start-up, Contingency Trading Facility, Inc.

The company is now in the process of raising $1.2 million in venture capital to build a fully configured trading floor that brokerage firms could use in the event that their own trading facilities are knocked out.

Victor Chenci, a senior consultant with Contingency Trading, said the backup facility will be based in Brooklyn, N.Y., and should be completed in the fourth quarter of this year. Chenci said Nynex will work with users to plan ways to route voice and data traffic to the facility.

No other disaster recovery service for brokerage trading floors exists in the New York area, Chenci said.

RBHCs unclear on Computer III

continued from page 4

hanced services could slow down the introduction of new services and make that process more costly."

After studying the case for three years, the U.S. Court of Appeals for the Ninth Circuit ruled on June 6 that the FCC had not garnered enough evidence to justify reversing its rules governing provision of enhanced services.

The FCC's Computer III decision allowed the RBHCs to begin offering enhanced services through their telephone units as soon as the agency approved ONA plans, which laid out how the carriers would provide equal network access to rival enhanced services providers.

The FCC also set up an interim process that allowed the RBHCs to file network plans, known as Comparably Efficient Interconnection (CEI) plans, on a case-by-case basis so some enhanced services would be offered through their telephone units until ONA plans were complete.

The appeals court ruling creates a complicated legal situation because six of the seven RBHCs have used the CEI process to offer all or part of their enhanced services operations through their telephone units (see graphic).

Ameritech chose to take a different path. The carrier offers two enhanced services — an audiotex gateway and its Tigon voice mail service — through separate business units.

An Ameritech spokesman said, "We felt it was a good business decision to offer enhanced services through the nonregulated side of the business because it gets at our long-term strategy to increase usage of the network."

As proof that its strategy is helping independent enhanced services providers blossom, the Ameritech spokesman said that out of 17 different trials of voice-messaging service currently under way in Ameritech's region, only one involves Ameritech's enhanced services operation, Ameritech Services Corp.

Neither the FCC nor the RBHCs had concluded last week whether the court's ruling means that the carriers will immediately have to spin off their enhanced services operations from the telephone units.

A source at one of the RBHCs said the carriers are considering filing a joint petition suggesting that the FCC set up an interim structure to allow them to continue offering enhanced services under current guidelines.

The RBHCs say it would be an enormous effort to remove enhanced services operations from their telephone companies. They say it would involve reassigning salespeople, finding new office space and determining how to handle customers already using the services.

The FCC must now decide how to approach the decision. It can ask the full appeals court to review the earlier decision.

The deadline for this filing is Wednesday, but the FCC has asked the court for a three-week extension to consider its options.

According to telecommunications attorneys, asking for a rehearing would buy the agency time because the decision overturning Computer III would automatically be put on hold until the court issued a decision.

If the appeals court refuses to reconsider the case or if it upholds the earlier decision, the FCC or RBHCs could appeal to the U.S. Supreme Court. That process could take two years.

The last, and least likely, option, according to attorneys, is that the FCC could accept the court's ruling and immediately open a new public proceeding on the rule changes for Computer III.

How enhanced services have been handled by the RBHCs

RBHC	Services	Offered through
Ameritech	Audiotex gateway, voice mail	Separate subsidiaries
Bell Atlantic Corp.	Message storage service, voice messaging, information gateway, E-mail, Nexis EDI,* protocol conversion	Telephone operations
BellSouth Corp.	Voice messaging	Telephone operations
	Information and audiotex gateways	Separate subsidiaries
Nynex Corp.	Voice messaging, information gateway,** protocol conversion	Telephone operations
Pacific Telesis Group	Voice messaging, electronic messaging, protocol conversion, voice store and forward	Telephone operations
Southwestern Bell Corp.	Protocol conversion, voice messaging, audiotex and information gateway trials	Telephone operations
US West, Inc.	Voice messaging, protocol conversion, information gateway trial,** E-mail trial, voice store and forward	Telephone operations

* Not yet commercially available.

** Nynex and US West have asked the FCC to declare their information services gateway to be a basic rather than an enhanced service.

GRAPHIC BY SUSAN J. CHAMPENEY

Push for TCP/IP miffs backers

continued from page 1

Computer Services Co. and chairwoman of the North American MAP/TOP Users Group.

ANSI's Network and Transport Layers Task Group X3S3.3 will decide next week whether to move forward with the effort to give ANSI-standard status to four protocols: TCP; IP; the User Datagram Protocol, a connectionless transaction protocol; and the Internet Control Message Protocol, used to convey control and error messages. The four are the core protocols of the TCP/IP suite.

Today, TCP/IP standards are under the jurisdiction of the 11-member Internet Activities Board (IAB), a closed group that elects its own members, said Vinton Cerf, IAB chairman. However, TCP/IP development work is handled by the Internet Engineering Task Force (IETF), which forwards its work to the IAB for approval. IETF meetings are open to all interested parties.

That process is not expected to change under the new proposal, but the IAB will forward the standards to ANSI for approval, said Lyman Chapin, chairman of the X3S3.3 Task Group and a senior consulting engineer at Data General Corp. here.

Chapin said the proposal to standardize TCP/IP came from members of his task force, which is dominated by vendors. Members were concerned because vendors are putting increasingly greater resources into TCP/IP products, yet the protocols do not have the seal of approval from an accredited standards body.

"You're just asking for somebody to sue someone over a change to the [IAB] documents," Chapin said.

The proposal would also give the same organizational structure to the TCP/IP development process that already exists within ANSI, which is the U.S. arm of the International Standards Organization. That would help to determine where development efforts overlap.

"The last thing you want to do is take a scarce resource and dilute it just because you think it's important to keep two things separate," Chapin said.

OSI advocates agreed that technical resources should not be diluted but said the move by ANSI would have the opposite effect.

"If we are trying to kindle fires under TCP/IP at this point, there's no question that'll decrease some steam on the OSI side of things," said Chuck Gardner, manager of standards and telecommunications for Eastman Kodak Co.

"We seem to be having trouble getting a common vision about where we're going. It's similar to having two Unix camps," said Gardner, who is also active in the Corporation for Open Systems International and the MAP/TOP group.

But Internet users said they see ANSI standardization as a way to create more widespread acceptance of the protocols, which in turn will spur development of more interoperable products.

"It will expose the [TCP/IP] protocols to a wider audience that may not realize those protocols can provide a solution to their networking problems," said Marshall Rose, principal scientist at Performance Systems, Inc., which runs a TCP/IP-based public network.

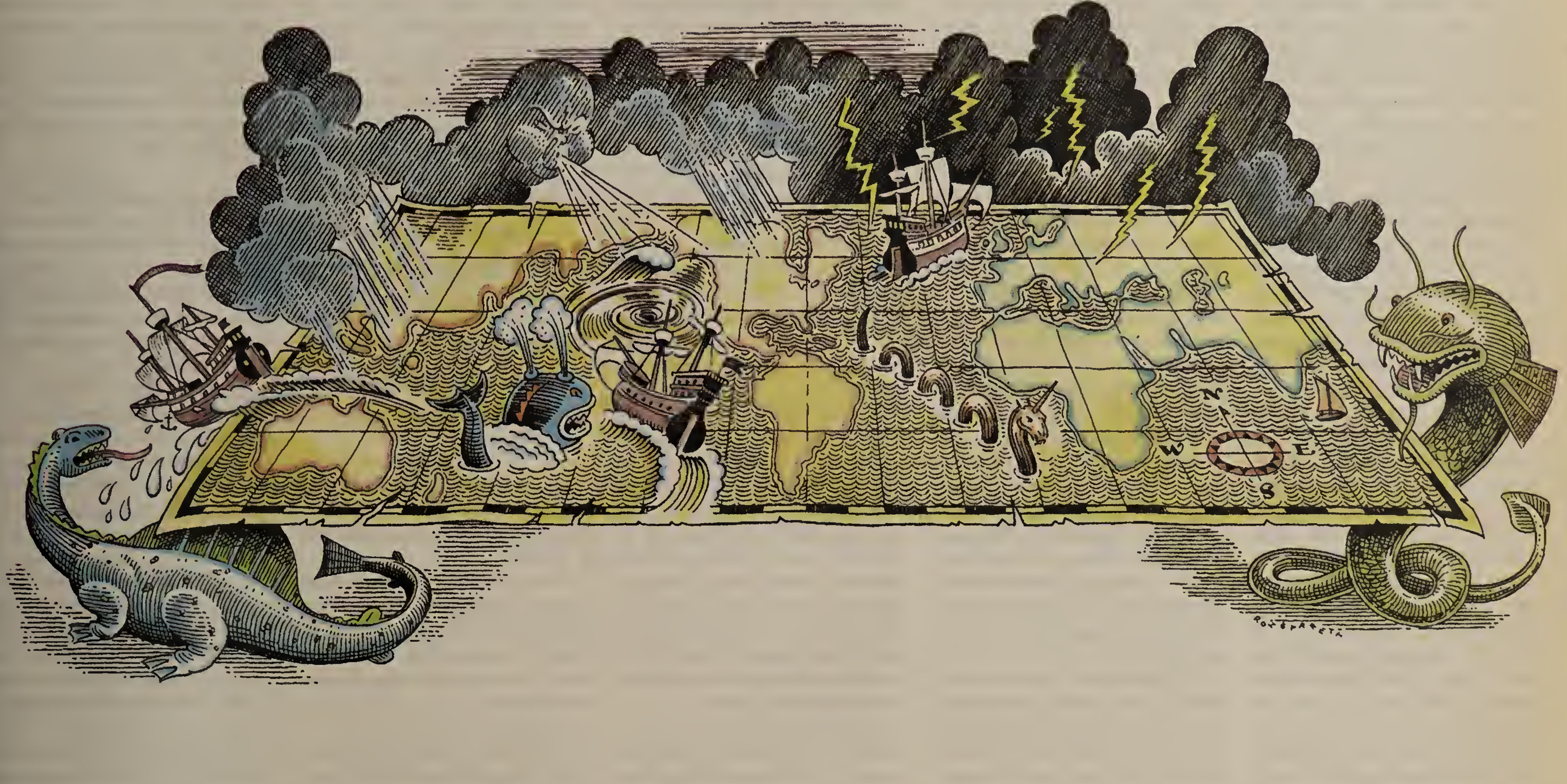
But that is considered a problem by OSI advocates.

"There's going to be many more products installed that aren't totally OSI, and it's just going to make it a [more complicated] migration plan over a longer period of time," said Mike Kaminski, manager of computer-integrated manufacturing/networking technologies for General Motors Corp.'s advanced engineering staff and a longtime OSI advocate.

Internet users contend the ANSI effort will forge cooperation between the TCP/IP and OSI camps and the formation of coherent migration strategies, such as the development of new OSI applications that run over both the OSI and TCP/IP stacks.

Gardner agreed that the formation of migration strategies could be a positive result but said OSI applications that work over TCP/IP nets have been and will continue to be developed, regardless of the outcome of next week's vote.

Beware of one-dimensional 800 networks.



Unlike US Sprint's "flat" network architecture, AT&T's 800 Network provides more alternative routes and technologies so you'll never find yourself flat out of luck.

When it comes to 800 service, AT&T's concept of reliability is quite a bit different from Sprint's.

While Sprint® prides itself on its 100% fiber optic network, or "flat" architecture, we see this lack of diversity as a lack of reliability. For example, in some cities such as San Francisco, Sprint's 100% fiber optic network has no built-in routing alternatives in the event of a fiber cut. And that could leave Sprint customers flat out of luck.

AT&T, on the other hand, views a reliable 800 service the same way we view the world—as being well-rounded.

AT&T's 800 Service is unsurpassed in diversity and depth of protection. The AT&T Network has more miles of fiber and integrated technologies to deliver a level of call completion* unsurpassed by any long distance network. In fact, even if your 800 service is disrupted because of a problem with your own equipment, only the AT&T 800 Assurance Policy guarantees to get you back in touch with your customers within one hour.

What this means is that we have more ways to get your 800 calls through than any other network. Especially a one-dimensional, "flat" network.

So when you take a broad view of the world, you can see there's a world of difference between AT&T 800 Service and any other.

And that's the flat-out truth.

To discover a new level of reliability, just call the most reliable network in the world—AT&T.

Reliability. Another AT&T advantage.

For more information, call your AT&T Account Executive or 1 800 222-0400.

AT&T
The right choice.

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*Call completion results based on domestic 800 services.

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Novell, partners air WAN tools

continued from page 1

cialized hardware in either configuration.

While Communication Services will ultimately support modules providing access to different types of hosts and WANs such as X.25 and T-1, the initial release focuses on connectivity to resources in IBM Systems Network Architecture environments.

The main pieces from Novell in the first release are: NetWare 386 Services for SAA, a LAN-to-IBM host communications server developed with the help of SNA specialist Netlink of Raleigh, N.C.; and NetWare Communication Services Manager, which lets network administrators manage all NetWare 386 Communication Services in an enterprise network from a single console.

To access the Systems Application Architecture (SAA) NLM from NetWare clients, Novell introduced three basic 3270 terminal-emulation applications for DOS and Macintosh clients, and those running Microsoft Corp.'s new Microsoft Windows 3.0. These packages are being provided for customers who want a Novell solution; Novell said it expects third parties to develop competing applications.

Novell's Macintosh-based emulator, for example, will get some competition from microcomputer-to-mainframe pioneer DCA with its MacIrma WorkStation, which DCA said will support the first release of Communication Services. Macintosh clients running MacIrma software will be able to access IBM hosts via the NetWare 386 Services for SAA gateway.

Garry Betty, DCA president and chief executive officer, said his company plans to add support of NetWare 386 to other products as well.

Novell's Windows-based emulator may take a back seat to Redmond, Wash.-based Wall Data, Inc.'s Rumba, a pioneering Windows-to-3270 connectivity product that provides a user-friendly interface to host data and can route mainframe printouts to personal-computer printers.

John Wall, founder and chairman of Wall Data, said NetWare 386 Communication Services will be added to the list of connections Rumba and its associated run-time module and developer's kit already support: token-ring, coaxial, Network Basic I/O System, asynchronous and Synchronous Data Link Control links. "We think NetWare 386 Communication Services will establish a large installed base of corporate users and become an industry standard," Wall said.

Phaser Systems, a private company in San Francisco owned by Ray Noorda, Novell chairman and chief executive officer, introduced the NetWare SNA Router, an NLM that runs on NetWare 386 3.1 and uses NetWare 386 Services for SAA to route traffic between NetWare clients and various IBM hosts on the network.

The product supports peer-to-peer LU 6.2 links, so it does not require a mainframe component. However, it can be used with Phaser's existing NetWare for MVS and NetWare for VM in large, complex networks. In the latter case, NetWare LANs would run front-end applications, processing data that would then be used to update host data bases.

Proteon said it would support the NetWare Communication Services Manager with its client-based TokenView Plus and TokenView Manager software, which provide physical-layer management of local- and wide-area token-ring networks, respectively.

With the TokenView products linked to a Novell communications server, a network administrator can see and control both the physical and logical components of the LAN from a single network management console.

"We are experts at managing the physical network, while Novell is very good at managing the logical network," said Kumar Shah, senior product manager at Proteon.

SynOptics was on hand to announce an implementation of the Simple Network Management Protocol that would run over Novell's native Internetwork Packet Exchange (IPX) transport protocol. When used with NetWare 386 Communication Services, it will enable network administrators to see across IPX routers and manage any device attached to a SynOptics concentrator on a WAN.

Currently, only the devices on the same LAN segment with the administrator can be seen and managed by that administrator.

Lastly, wholly owned Novell subsidiary Indisy Software of Los Angeles announced NLM versions of its OfficeWare products that will use the Communication Services to access hosts on SNA networks. The OfficeWare line features electronic mail, group scheduling and document translation.

There is likely to be some sticker shock as users accustomed to paying about $3,000 for an SNA gateway take a first look at the server platform.

The Communication Services Manager costs $4,995, and NetWare 386 Services for SAA costs $5,995 for a version supporting up to 64 host sessions and $14,995 for a 254-session configuration.

Similarly, the price tag on a 64-user version of the DCA/Microsoft Comm Server, which is based on OS/2 LAN Manager and due out at about the same time as NetWare 386 Services for SAA, is $8,995. Both offerings clearly represent a different class of product from the traditional SNA gateway, but convincing users that the increased functionality is worth the additional cost is likely to be a tough sell at first.

"It will take awhile for users to grasp all of this and start making use of it," said Don Miller, director of marketing for SynOptics. "But once people are able to put it in the right perspective, it will start looking like a very good deal to some of them."

The NetWare 386 Communication Services and third-party products are scheduled for release this fall.

OSI/NM Forum releases specs

continued from page 6

"Network management is one of the missing links," said Ron Ellis, senior information systems specialist for the Military Aircraft Division of LTV Aircraft Products Group in Dallas. "We want to move to OSI, and the availability of network management products based on OSI should make it easier."

In the short run, the forum's announcement may be bigger news for vendors than users, according to Kevin O'Neill, vice-president of networking research and consulting at Business Research Group, a Newton, Mass.-based market research and consulting organization.

"In and of itself, this announcement won't put products on the street," O'Neill said. "But it does create the environment for vendors to provide OSI-based network management products that are interoperable and tested to work together."

Second and third releases

The forum said later this year it will release the second set of specifications covering diagnostic and testing management, including a detailed specification for bulk transfer of information between systems.

The third release of specifications, due out next year, will cover security, performance and accounting management, along with path tracing for fault isolation and trouble ticketing for event reporting.

The forum, which last week held its annual meeting and President's Roundtable discussion with large network users, also named new board members and trustees. Robert Montgomery, director of business development at Bell Canada, was elected as the group's president.

In other news, the forum announced that France Telecom upgraded its membership to that of a voting member.

The forum also welcomed five new associate members: BIM SA/NV, BTS Holdings, Ltd., Codex Corp., Copenhagen Telephone Co. and Data Communications Corp. of Korea.

Retailers stock stores with LANs

continued from page 1

tributed processing will allow them to make decisions based on customer tastes at the store level.

"LANs can be more cost-effective, support more applications and be more easily managed than existing retail systems," said Mary Modahl, director of network strategy research at Forrester Research, Inc., a Cambridge, Mass.-based market research firm. "Retailers typically aren't eager to adopt new technologies, but they can't resist LANs."

The adoption of LANs and the move to decentralized processing is being driven in large part by growing competition and declining profit margins, said Harris Gordon, senior manager for retail industry research at the Boston office of consultancy Deloitte & Touche.

> "LANs can be more cost-effective, support more applications and be more easily managed than existing retail systems."
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Decentralized processing helps retailers differentiate themselves by enabling them to make merchandise decisions based on immediate local sales data, he said.

"Retailers don't want in-store systems that just collect data. They want systems that will give them an edge by letting them share data and use it right away in the stores" to help them make on-the-spot decisions, such as whether to reallocate shelf space, he said.

Follow the leaders

Not surprisingly, K mart and other large retailers are out in front in the move to decentralized processing.

K mart has installed IBM Token-Ring LANs in some 1,800 stores during the past two years. The company recently ordered 1,000 Unisys Corp. 80486-based Series 6000 personal computers that will be used as servers to support LAN-based inventory control systems in its stores.

"We are now convinced that our commitment to Token-Ring and decentralized computing a couple of years ago was one of the best things we ever did," said David Carlson, senior vice-president of corporate information systems at K mart's headquarters in Troy, Mich.

Last month, J.C. Penney Co., Inc. announced plans to buy more than $45 million worth of NCR Corp. point-of-sale workstations that will be linked with AT&T Starlan networks at some 1,330 stores nationwide.

On a smaller scale, Fenton, Mich.-based VG's Food Center, a grocery chain, recently installed three IBM Token-Ring Networks.

"Local-area networks let VG's do more processing at the stores and send more streamlined data for processing [to the central processing site]," said Bob Fisher, senior communications analyst at Spartan Stores, Inc., a Grand Rapids, Mich.-based retail cooperative that provides communications services, as well as groceries and merchandise, to grocery store chains. Spartan Stores installed VG's LANs to replace stand-alone personal computers.

Compared with the terminal-to-host systems at many stores, LAN-based decentralized processing has resulted in cost savings, Fisher said.

Offerings geared for LANs

Another clear indication of the shift in information processing is that leading vendors of point-of-sale data collection devices and in-store computer systems are gearing their offerings to run on LANs.

Point-of-sale terminals and cash registers are now being designed to tie into personal computer-based controllers that can be linked into LANs supporting applications ranging from bridal registries to employee attendance tracking, analysts said.

LAN-based applications allow retailers to conduct pinpoint marketing that is focused on the tastes of local consumers, said Frank Andrews, senior manager at the KPMG Peat Marwick consultancy in New York.

Jeffrey Luker, a partner in the New York office of Andersen Consulting, said decentralized processing is being driven by the desire to make more sales-related data available to store managers.

Driving decision making down to the store level benefits retailers and employees, Andrews said.

"One of Wal-Mart's hallmarks is keeping every employee, from the store manager to the janitor, involved," Andrews said. "Retailers can keep employees at their stores involved with their information systems."

Kathleen Cook, a partner at Eastbourne Consulting Group, Inc., a New York-based consulting firm that sells software used to track in-store theft, summed up the change that is taking place at stores nationwide.

"It used to be that store managers were the guys that locked and unlocked the doors," said Cook, a ex-MIS retail executive. "Their stores got what headquarters decided they should get. Now that individual store managers are giving feedback and making their own decisions based on locally and centrally processed data, you've got the best of both worlds."

AT&T unleashes FDDI products

continued from page 2

Control Protocol/Internet Protocol, Open Systems Interconnection, X.25, Digital Equipment Corp.'s DECnet, Xerox Corp.'s Xerox Network Systems, Novell, Inc.'s Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) and Apple Computer, Inc.'s AppleTalk.

Donnelly noted that the Starwan Brouter Model 450 can attach to both rings in an FDDI network, enabling data to be routed in the opposite direction if one ring fails. This provides users with built-in redundancy. The router software offers dynamic routing capabilities that allow the FDDI ring to automatically bypass any link failures, he said.

The Starwan Model 450 also performs concurrent media access control-level bridging that supports DEC's Local Area Transport protocol, which enables end users attached to a terminal server to access DEC LANs via the FDDI backbone.

It also supports the Simple Network Management Protocol (SNMP) for network management and Station Management for FDDI.

The Starwan Brouter Model 450 is priced at $40,000 for a typical configuration, which includes one FDDI dual-attachment card and six Ethernet interfaces. It is expected to ship in December.

FDDI bridge

AT&T also rolled out its Starwan Multi-Bridge, which interconnects two Ethernets across an FDDI backbone.

The bridge supports the Spanning Tree Protocol and features the same forwarding rate of 20K packet/sec as the FDDI-based Starwan Brouter.

The Starwan Multi-Bridge is also equipped with an address learning feature that enables it to learn the locations of devices on the bridged networks and build routing tables to deliver data to the appropriate destination.

The Starwan Multi-Bridge is due out in December and costs $21,250 for the base configuration, which includes an FDDI interface and two Ethernet interfaces.

Starlan concentrator

AT&T unveiled its Starlan 100 Network Concentrator, a star-wired hub that supports up to 14 direct connections to an FDDI backbone for workstations, bridges, routers and gateways, Donnelly said.

The Starlan 100 Network Concentrator supports 62.5 micron multimode fiber-optic cable connections between workstations and the concentrator; fiber is also used to link the concentrator to the FDDI backbone.

The Starlan 100 Network Concentrator comes with a "hot-plug" feature that allows the network administrator to isolate and automatically remove a faulty node from the ring without disrupting network operations.

The Starlan 100 Network Concentrator pricing ranges from $14,500 for two FDDI interfaces to $40,000 for 14 FDDI interfaces.

AT&T also unveiled the entry-level Ethernet-to-Ethernet Starwan Brouter Model 200, designed for small and midsize users that do not need FDDI routing capabilities.

The Starwan Brouter Model 200 can link two Ethernets over two synchronous serial lines at speeds ranging from 9.6K bit/sec to T-1 speeds. In its initial release, it can route AppleTalk, DECnet, TCP/IP and XNS protocols. It also supports SNMP.

Future versions will include routing support for OSI and Novell's IPX/SPX protocols, Donnelly said.

> The Starwan Multi-Bridge is equipped with a feature that enables it to learn the locations of devices on the bridged networks.
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AT&T said that unlike the larger Starwan Brouter Model 400, which is used in central sites and supports FDDI, the Model 200 is targeted at small remote field offices, such as bank branches, and retail and convenience stores.

The Starwan Brouter Model 200 is due out in October. The base configuration, including one Ethernet interface and one T-1 serial link, costs $9,350.

New 10BaseT products

AT&T also introduced two new 10BaseT-compliant additions to its Starlan line.

The Starlan 10 Network Microchannel 200 Network Access Unit is a plug-in expansion board that lets users attach IBM Personal System/2s to an AT&T Starlan 10 network via twisted-pair wire. The board is expected to ship next month; it costs $445.

The Starlan 10 Network Coax Adapter is an IEEE 802.3 Ethernet media access unit that allows users to connect existing thin-wire, coaxial cable-based Ethernet LANs to a Starlan 10 network hub via unshielded twisted-pair wire.

It supports the 10BaseT draft standard of a maximum distance of 330 feet, or about 100 meters, between the Starlan 10 Network Coax Adapter and the network hub. The Starlan 10 Network Coax Adapter is available now and costs $795.

EDI pits banks against VANs

continued from page 1

contracts, financial EDI could grow from almost nothing today to a multibillion dollar market.

"It's really the next logical step in an EDI implementation after you start handling purchase orders and invoices electronically," said Robert Tettenbaum, managing vice-president of First Manhattan Consulting Group in New York. "My prediction is that the 1990s will be the decade of [financial] EDI."

A study by the accounting firm Ernst & Young, referenced in the National Automated Clearinghouse Association's "1990 EDI Payments Progress Report," concluded that 44% of all U.S. banks and 80% of the top 20 U.S. banks now offer some kind of financial EDI services, although transactions volumes are low (see graphic, page 1).

The study pointed out, however, that several large corporations and government organizations have made commitments to use financial EDI. Consequently, the demand for financial EDI services could rise rapidly in the next few years.

As the market expands, banks and VANs are jockeying with each other to see who can land the lion's share of revenue from financial EDI transaction transmission services. Each touts a distinctive set of advantages.

Banks want to carry payment data through the same networks they use to support electronic funds transfer. They argue that keeping the dollars and data together will be inherently more secure and reliable than separating the two, as VANs want users to do.

VANs, which are not allowed to provide electronic funds transfer services, are at least trying to get customers to route payment data to them. VANs will then instruct banks to initiate electronic funds transfers on behalf of their customers. The VANs argue that users will find it easier to carry financial data through the same EDI networks they use to carry electronic purchase orders and invoices.

"Banks, as an industry, are very concerned," said Randy Kahn, vice-president of the electronic business services unit of First Interstate Bank, Ltd., the banking subsidiary of Los Angeles-based First Interstate Bancorp. "They'd like to have all the processing for financial EDI themselves, but VANS are offering at least the information [processing] for it."

Tettenbaum added, "VANs are going to be big rivals in this. Banks have a unique advantage in that they have access to the payment system. But aside from that, you can turn it around" and say VANs might be more adept at handling financial EDI transport services.

Big risks

For banks, the risks associated with financial EDI are especially big because the technology could actually end up taking revenue away from other services.

While opening up new growth opportunities for electronic services, financial EDI promises to diminish sales of one of the banking industry's biggest cash cows — lockbox operations, in which banks receive and sort through paper checks and remittance forms on behalf of customers.

For example, Phillips Petroleum Co. in Bartlesville, Okla., this year initiated a financial EDI program with New York-based Manufacturers Hanover Corp. By using financial EDI, Phillips will reduce its reliance on a more costly lockbox service from a local Bartlesville bank, according to Ron Gisi, Phillips' director of disbursements.

Profit margins

Several industry observers predict that profit margins of financial EDI services are likely to be lower than profit margins for lockbox services.

"There is a large potential for disintermediation of revenues," Kahn acknowledged. "But if you believe, as we do, that the economic and competitive forces driving EDI are incontrovertible, its clear you've got to invest to provide clients with the functionality they require."

First Interstate Bank began marketing financial EDI services to its customers this year. In an interesting twist on competition between banks and VANS, the bank is using software from Rockville, Md.-based GE Information Services to supply financial EDI services to bank customers.

GE Information Services also sells financial EDI transport services. Banks and VANs concede that although they are competing for revenues from transport services, they must cooperate in areas such as software design and consulting services.

"We can have alliances as well as competition," said Joyce Healy, senior vice-president of Geoserve, the bank operations arm of Manufacturers Hanover. "For example, we're a big customer of GE Information Services. On the other hand, we once had a customer solicit a bid from both us and GE" for a contract to supply financial EDI transport services.

As for the future, most observers say it is too early to predict who will win in the budding competition for financial EDI transport services. A key factor, though, will be keeping service prices low.

Group warns of dire risk to N.Y.

continued from page 4

should "take other steps to increase incentives for carriers to rapidly introduce innovative services and to undertake the major capital investments required to maintain a world-class network," the report said.

In addition, the report said the state and city should make it easier to lay fiber along publicly owned rights-of-way such as bridges and tunnels, shorten the approval process for laying cable under streets and use other powers to facilitate deployment of advanced technologies and services. The state and city should make a commitment to first stabilize taxes on telecommunications and then reduce them over the long term, it concluded.

"New York City's position as a premier international business capital — including its millions of telephone calls, data transmissions and electronic funds transfers every business day — is inextricably bound [to] its advanced telecommunications system," said Ronald Shelp, president and chief executive officer of the partnership and the New York Chamber of Commerce and Industry.

"That is why we cannot afford to gamble either with the system's ability to resist disasters or its status as a technological leader," he said.

The study found that on an average business day, lower Manhattan makes 21 million calls and accounts for 35% of all international calls made from the U.S. Businesses and residences in the state of New York make more calls per year than France or the U.K. The report said three electronic bank payment systems in lower Manhattan handle roughly $1.5 trillion worth of transactions a day.

Phone calls, facsimile traffic and data transmissions are supported in New York City by more than 74,000 miles of fiber serving 470 buildings and 70 central offices. Of those central offices, 83% have digital switches. But the report added that both central offices and transmission facilities have proven to be vulnerable to failure.

As reasons for concern, the report cited the May 1988 fire in the Hinsdale, Ill., central office that knocked out service for 35,000 customers for up to two months and a November 1988 fiber cut in Trenton, N.J., that disrupted long-distance service on the East Coast for almost an entire day, blocking 3.5 million calls.

The report said that many systems and major financial institutions have their own disaster protection and redundant capacity, but it added that a widespread loss of telecommunications services in Manhattan — due to problems in one or more central offices or at several key cable points — could deny users access to these payment systems.

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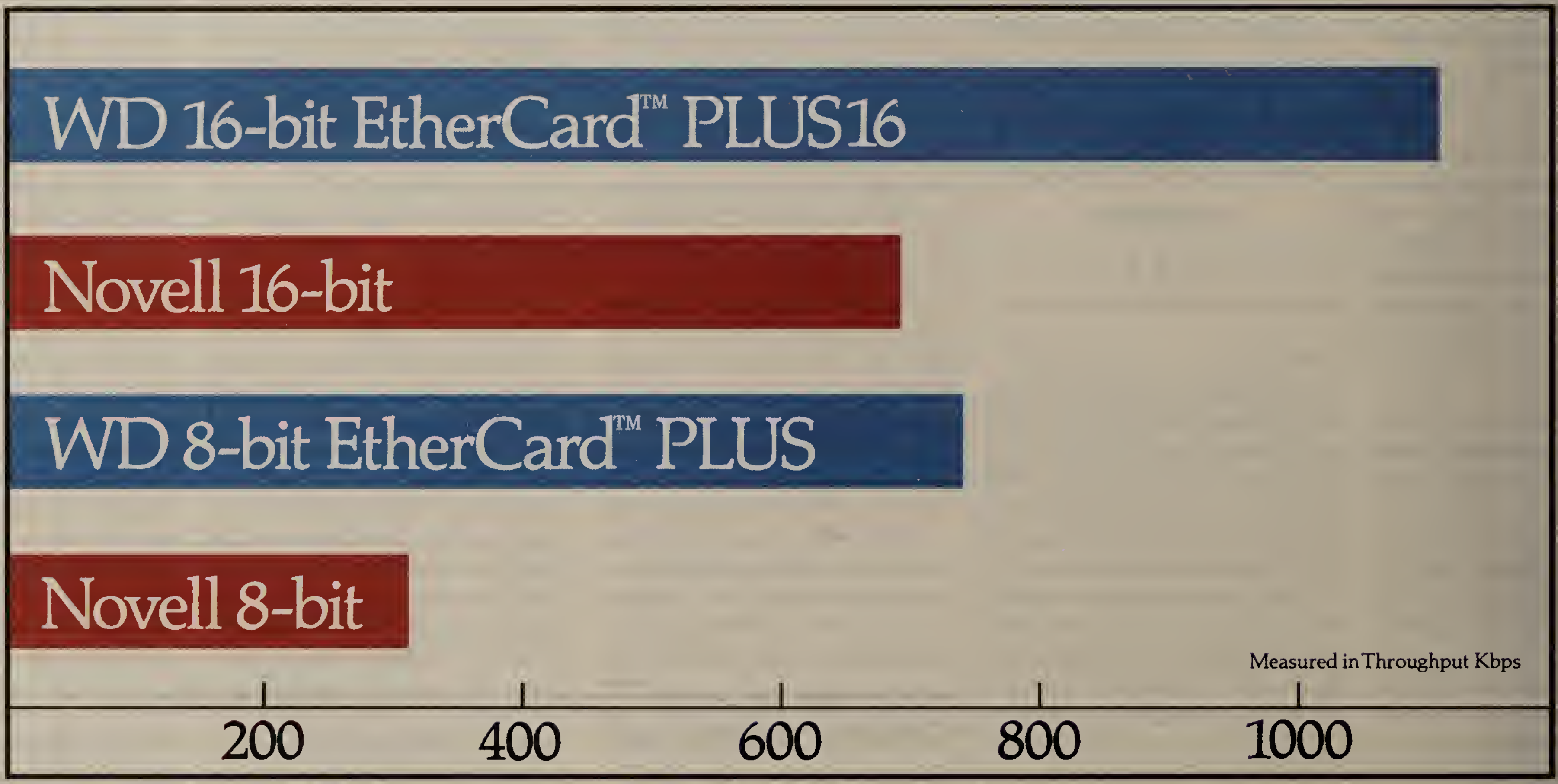

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